GAS JOURNAL

LIGHT • HEAT • POWER • BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

VOL. CLIX. No. 3089.] LONDON, JULY 26, 1922. [74TH YEAR. PRICE 1s.

OXIDE OF IRON
SPENT OXIDE

GAS PURIFICATION AND CHEMICAL CO., Ltd.
PALMERSTON HOUSE, LONDON, E.C.2.
Telegrams: "PURIFICATION, LONDON."
Telephone: 9144 LONDON WALL.

PUMPING ENGINES
All Types for ACID, &c.
CAST-IRON OR STEEL TANKS
Any Capacity.
CHEMICAL PLANT.
Roofs and Girders. Structural Work.
SULPHATE OF AMMONIA PLANT
Air and Gas Compressors.
MIXERS.
TAR STILLS AND CONDENSERS.
W. NEILL & SON, LD.
Engineers, Iron & Brass Founders,
ST. HELENS JUNCTION.
Telegrams: 'NEILL, ST. HELENS.' Telephone No. 20.

JOHN ELLIS COWCILL,
Colliery Offices:
SILKSTONE COMMON,
Nr. BARNSLEY.
The finest qualities of Screened Gas Coal, Washed Gas Cobbles, Washed Nuts, and Slack.
Telephone: 1 SILKSTONE.
Telegrams: "COWCILL SILKSTONE."

"TORBAY PAINT"
FOR ALL PURPOSES.
The TORBAY PAINT CO.,
26/28, Billiter St., LONDON, E.C.
39/41, Old Hall St., LIVERPOOL.

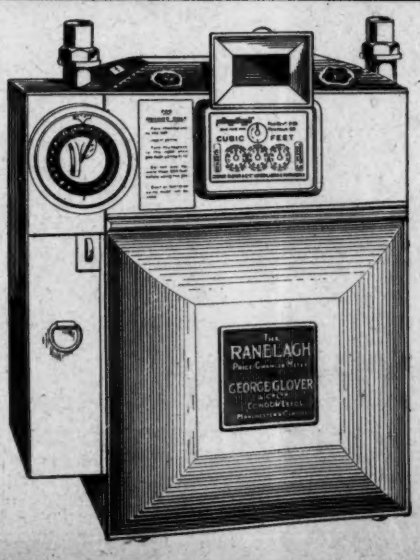
"BLUEBELL"
SILICA RETORTS
(95% SILICA)
John G. Stein & Co., Ltd.,
Castleoary, SCOTLAND.

Telephones: 8966 VICTORIA. 8967 Do.
Telegrams: "GASIFICATION, Sowest, LONDON."
WALTER MOORE & SONS,
GAS COAL & COKE CONTRACTORS,
72, VICTORIA STREET,
LONDON, S.W. 1.

W. & B. COWAN
(Incorporated in Parkinson and W. & B. Cowan, Ltd.),
LONDON. MANCHESTER. EDINBURGH. GLASGOW.
SYDNEY. MELBOURNE. BRISBANE. WELLINGTON, N.Z.
(See Advertisement on p. iii. of Wrapper.)

JAMES McKELVIE & CO.
Coal Owners,
Gas and Steam Coal Contractors,
17, RUTLAND SQUARE, EDINBURGH.
59, MARK LANE, LONDON, E.C.
GUILDHALL CHAMBERS, SANDHILL,
NEWCASTLE-ON-TYNE.
24, CHAPEL STREET, LIVERPOOL.
ESTABLISHED 1849.

STEWARTS AND LLOYDS, LIMITED, 41, OSWALD STREET, GLASGOW. BROAD STREET CHAMBERS, BIRMINGHAM.
TUBES & FITTINGS for Gas, Steam, Water, &c.



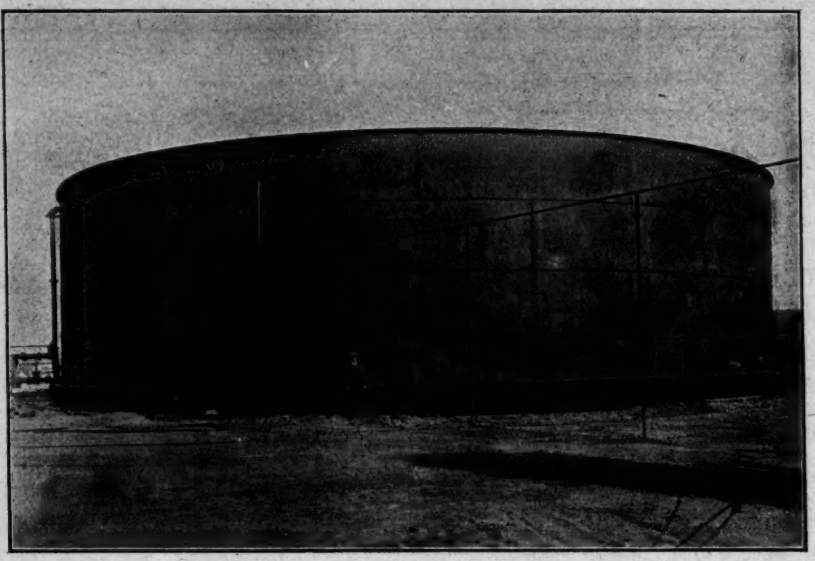
George Glover's New
"Ranelagh"
Price-changer Pre-payment Gas Meter.
All operations are performed from the front; thus the greatest convenience is afforded for consumer. This feature also allows of the Meter being fixed in a corner.
GEORGE GLOVER & CO., LTD.
Ranelagh Works, Royal Avenue, Chelsea, London, S.W.3.
Branches: 74, Diamond Street, Cardiff; 9, Dewsbury Road, Leeds, & City Meter Works, Manchester.

Reduce your Maintenance Costs by using "FERRODUR" ELASTIC PAINT It is the cheapest because it lasts twice as long as other Paints. GRIFFITHS BROS. & CO. LONDON, LTD. BERMONDSEY, LONDON, S.E. 16.

HEAD, WRIGHTSON, & CO., LD., for PURIFIERS, &c.

GASWORKS PLANT | GASHOLDERS PURIFIERS & SCRUBBERS

STEEL and CAST IRON TANKS, PIPES and RETORT FITTINGS, etc.



CONDENSERS and WASHERS — LAMP PILLARS of all Descriptions and Sizes

STEEL TANK, 90 FT. DIA., BECKTON GAS-WORKS.

THE HORSELEY BRIDGE & ENGINEERING CO., LTD.,

London Office:
11, VICTORIA ST., WESTMINSTER, S.W. 1.

TIPTON, STAFFS.

PREVENT
Naphthalene Troubles

BY USING AN

OIL SPRAYING PLANT

(As designed by the South Metropolitan Gas Company, and in use at their stations).

This apparatus is arranged to give the most efficient quantity of finely divided oil spray in relation to the quantity of gas being used.

The oil is perfectly vaporized, and is carried forward by the gas with a minimum of condensation.

The oil being sprayed by gas, no air or steam enters the mains.

Thorough mixing of the oil with the gas.

PORTABLE PLANTS OR FIXED PLANTS.

Simple in construction. Minimum cost to instal. Cheap to operate and maintain.

A Gas Engineer informs us that since using this Sprayer the number of complaints per month has been reduced from about 850 to 30.

Prices and Particulars on application to—

THE BRYAN DONKIN COMPANY, LTD.

Head Office and Works: - - CHESTERFIELD.

London Office: 3, Victoria Street, WESTMINSTER, S.W. 1.

CONTENTS.

EDITORIAL NOTES.

Breaking Through the Barrier of Conservatism 201
Therm Education 201
An Official Advantage. 202
The Smoke Abatement Bill 202
An Innovation in Financing 202
Master Patterns and Jigs—Gas Coal for America—Special or Other Orders—Wilton's Continuous Tar Distillation Process. 203
Unemployment Insurance—Certificates of Exception and Exemption—Summer Time—A Spirit of Moderation—Coal Output and Prices—Gas Coal Exports—Gas Coke Shipments—Sulphate of Ammonia Exports. . 204

Personal 204
Special and Other Orders—Petitions by Opponents 205
Electricity Supply Memoranda 205
The New London County Council Hall—A Large Gas and Steam Cooking Equipment. 206
Southern Association at Luton—With the Davis Gas-Stove Company and at the Gas-Works. 207
A Manchester Gas Department Exhibit . . 208
Tar Distilling. By W. A. Walmsley . . . 209
The Thomas Gas-Meter and Recording Calorimeter 210
The Standardization of Gas-Cookers—Specification of the Standardization Committee of the National Gas Council 211
Manchester and District Junior Gas Association—Visit to the Derbyshire Silica Firebrick Company's Friden Works 212
Disposal of Spent Liquor 213

CORRESPONDENCE.

Life of Gas Meters Committee Report . . 214
Some Gas-Burners and a Moral 214

LEGAL INTELLIGENCE.

Carrying-On the Elmsall Gas-Works . . . 214

REGISTER OF PATENTS.

Burners for Incandescent Lighting—Sutton, C. J. 215
Manufacture of Dry Neutral Sulphate of Ammonia—The Ebbw Vale Steel, Iron, and Coal Company, Ltd., and Thickins, D. . . 215
Retorts—Low Temperature Carbonisation, Ltd., and Davidson, T. M. 215
Applications for Patents 215

PARLIAMENTARY INTELLIGENCE.

House of Lords—
Progress of Bills 216
House of Commons—
Progress of Bills 216
Royal Assent. 216
Gas Regulation Act, 1920 216
Public Utility Companies (Capital Issues) Act 216
Glassware Questions 216
Chester Gas Bill. 216
A New Smoke Abatement Bill 217

MISCELLANEOUS NEWS.

Reduced Gas Prices in London—Gas Light and Coke Company and South Metropolitan Gas Company 217
Gas Light and Coke Company's Meter-Rents—Cancelling an Agreement with the London County Council 217

MISCELLANEOUS NEWS—(*continued*).

Gas Regulation Act Applications 218
Gas Regulation Act Orders 218
Birmingham Corporation Accounts . . . 219
Birmingham Gas Prices 219
Sheffield Gas Company—Scale of New Charges for Gas 219
Heywood Corporation Gas-Works Report . 219
Stratford-on-Avon Gas Profit 220
Price of Gas at Hartlepool 220
Current Sales of Gas Products 220
Stock Market Report 222

PARAGRAPHS.

Dimensions for Malleable Iron Pipe Fittings. 206
Mechanical Handling and Storing of Material 208
South Metropolitan Gas Company's Dividend—Action of Light upon the Human Body—The Gas Light and Coke Company's Dividend 210
Elevating Coke by Skip Hoist—Gas for Drying Barrels—Interior Lighting of Shops—Huddersfield and the Therm System . . 214
Strabane Gas Profit 218
Ashbourne Plant Extensions—Sunderland Gas Cheaper—Stirling Gas Light Company—Aylesbury Gas Company's Area of Supply 219
Illingworth Carbonization Company, Ltd.—Further Reduction at Newport (Mon.)—Vincent Northcote Syndicate—Ownership of the Dysynni Gas-Works—Reduction at Brierley Hill—Borrowing Powers at Smethwick—Pitlochry Gas Company—Gas Light and Coke Company's Special Order . . 220
Dungarvan Lighting—Dublin Gas Matters—Mansfield Gas Undertaking—Price Reductions in Scotland—A Lamplighter's Fraud—Uppingham Gas Light and Coke Company—York Gas Company's Cookery Competition—Morley Gas Finances 221

For List of "JOURNAL" Advertisers see p. 225.

"JOURNAL" OFFICE TELEPHONE.

The "Journal" Office Telephone Number is "6857 Holborn."

HUMPHREYS & GLASGOW, LTD.,

AND

THE UNITED GAS IMPROVEMENT CO., U.S.A.

WATER GAS

BLUE & CARBURETTED.

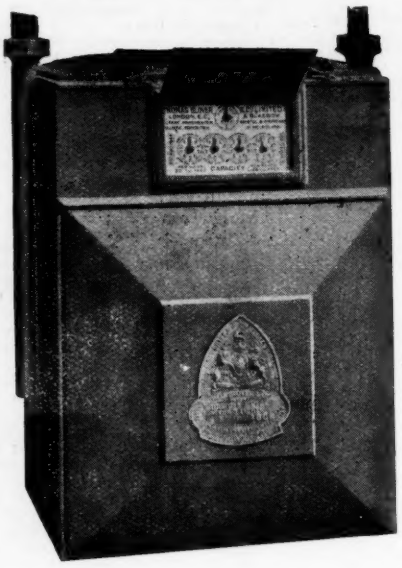
Humphreys & Glasgow, Ltd. **481,700,000** Cubic Feet Daily.

The U.G.I.Co., U.S.A. - - **947,200,000** Cubic Feet Daily.

Total - - **1,428,900,000** Cubic Feet Daily.

38, VICTORIA STREET, LONDON, S.W.1.

Brussels Office: 82, Rue du Trône, Ixelles.



Standard Meters

Our 78 years' experience in Dry Gas Meter manufacture is embodied in the design of our new Standard Meters.

The prestige of our Meters to-day is the result of our constant endeavour to maintain our own high standard of excellence.

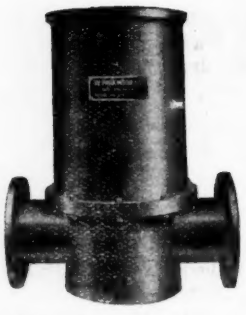
Thomas Glover & Co., Ltd.

(Original Makers :: Established 1844)

Gothic Works, Edmonton, London, N. 18.

PARKINSON'S

DISTRICT GOVERNORS.



Suitable for Boosting lines. Loaded by weights, or Pressure-loaded from a distance. Full-way to low pressure, and checking pulsations at high pressure. Self-lubricating.

W. PARKINSON & CO.,

(INCORPORATED IN PARKINSON AND W. & B. COWAN, LTD.)

COTTAGE LANE, CITY ROAD LONDON.	BELL BARN ROAD, BIRMINGHAM.	MORNINGTON STREET, ORMEAU ROAD, BELFAST.
Telegrams: "INDEX, LONDON."	"GASMETERS, B'HAM."	"PREPAYMENT, BELFAST."
'Phone Nos.: 4270 Clerkenwell	2245 Midland, B'ham.	3374 Belfast.

GAS JOURNAL

LIGHT ✂ HEAT ✂ POWER ✂ BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

PROPRIETORS: WALTER KING, LIMITED. OFFICE: 11, BOLT COURT, FLEET ST., LONDON, E.C. 4.

Telephone: Holborn 6857. —— Telegrams: "GASKING, FLEET, LONDON."

VOL. CLIX., No. 3089.] WEDNESDAY, JULY 26, 1922. [74TH YEAR.

EDITORIAL NOTES.

Breaking Through the Barrier of Conservatism

THE junior district gas organizations have in one respect shown much more wisdom than the senior district organizations. This may seem a little unkind to the latter; but the fact is so obvious that no harm can be done in mentioning it. The juniors have long since shown a disposition, which they have put into practice, for learning as much as they can about the conditions under which gas plant and gas-consuming appliances are produced; and this they have done by paying many visits to the works of manufacturers, who have been delighted to see them, and to show them all they can of their processes and methods. The manufacturers do not look for any immediate reward from this; but they are desirous that those on the gas-supply side of the industry shall know more of them and of their work. The Southern Association of Gas Engineers and Managers has always been a most conservative body, and tradition has garbed it thickly. On their excursions the members have visited gas-works, about which each and all know pretty well everything there is to be known—variations between one works and another being in the matter of size, types of plant, arrangement, and practices. But hitherto our good friends of the Southern Association have never collectively paid a visit to the works of a manufacturer of gas plant and appliances. It was against tradition and the unwritten law, notwithstanding that such works are the only places in which one can learn first hand of the conditions under which are produced gas plant and consuming appliances, upon which gas-supply engineers so much depend, and upon the efficiency of which they will have to rely more in the future than in the past for progress.

The dawn of a new day is here. We are glad to see it. The senior Southern Association has broken through the barrier of traditional conservatism. The members have in their official capacity paid a visit, with their energetic President (Mr. J. M. Campbell), to the works of the Davis Gas-Stove Company at Luton, and have seen there the exact operations of a well-appointed and extensive establishment devoted to the production of appliances which the industry needs for the development and maintenance of its business. We compliment the Association upon this excellent departure. It is a recognition that each part of the industry is necessary to the other; and the evidence of a mutual interest is, in our opinion, of the utmost importance—more so now than ever. It would be humorous—if it were not a really serious matter—to contemplate one side of the industry continuing to stand aloof from the other, although so essential to its progress. We like the appreciation of this that one finds in the remarks of Mr. Cyril G. Davis and Mr. Harold N. Davis at the luncheon which divided the visit to the stove-works and that to the works of the Luton Gas Company. An observation of Mr. Cyril Davis was: "Progress is necessary in the gas industry in all directions "to-day; and I feel it is good for gas engineers to visit the "works of some of the people with whom they do business." But why? We get the answer in the remarks of Mr. Harold Davis. He said: "I hope, as the result of their "visit to-day, the members of the Association will realize "that while science enters very largely into the gas-engi-"neering profession, it plays an equally important part in "the manufacture of the appliances which are essential "to the use of gas." This is very true. There has been more rapid progress effected in the design and efficiency of gas-consuming appliances since the manufacturers brought in science to their aid than when they pursued a well-worn rut in production which "standardized" an inefficiency which they now know, through science and a new attainment in efficiency, to have been altogether wrong. It is well that the gas-supply engineers should know this by taking the roads that lead to a more intimate knowledge. Ability and specialized attainments are not concentrated on one side of the industry; and those who entertain the belief that it is, will be shown their error by extending acquaintance of the scientific and practical character of the work that presents them with the gas-consuming appliances which play such an important part in the enlargement of the gas business. The advances of the one side of the industry are an aid to the other. Therefore work should be pursued on the most open terms of intimacy and co-operation; for, we are confident, this is the route of a quickened progress.

Therm Education.

THE gas industry has not yet discovered really effective measures to make the general public and the daily newspapers understand the therm system of charging for gas, which is the best possible method in the interests of gas consumers. There have been letters in the papers that aver that accounts are now heavier than in the corresponding quarter of last year. It can be easily demonstrated that, generally speaking, the charge per therm to day is something that has as its equivalent per 1000 c.ft. a lower figure than ruled twelve months ago. Yet there is the fact that the accounts for the "summer" quarter lately ended are in some cases higher than they were in the same quarter of last year. When memory reverts to last year, however, it is recollected that, in April, May, June, and onwards, we were sweltering under the persistent abnormal efficiency of the rays of the sun. Then windows were thrown wide open; and cooling drinks and light cold food were the requisites of human existence. This year we have seen gas-fires alight in June, and overcoats worn; and the demand has been for hot drinks and food. The claims of nature this year have caused an increase in gas consumption for domestic purposes; and this found expression in the gas accounts. No allowance is made by the public, ungenerous or with short memories, for the change in conditions.

Now the public have a new complaint. They have in some things a strong inclination for consistency. It is difficult for them to understand why, having got used to one calorific value per cubic foot, it has been necessary to change to a higher value, which gives them less cubic feet per therm. They do not understand that the less cubic feet of gas of a higher calorific value per cubic foot make not the slightest difference to them. Gas of different calorific values, within a good range, can be used with equal efficiency. Owing to want of knowledge, consumers become discontented; and the discontent is not assuaged by some of the representatives of the public Press. We have that usually well-informed paper—the "Evening Standard"—talking of the consumer not being able to follow the varying calorific values of his gas "unless he is a mathematician," and of a senior wrangler being wanted. Then it shows its own deficient knowledge of the matter by stating that, in the case of one company, "the gas was of an average "calorific value of not less than 4·75 Brit. thermal units "gross per 1000 c.ft. from April 1 to June 14, and of "5·0 therms from June 15 to June 30." This is a complete attestation of the present inability of the writer in the "Evening Standard" to discriminate between B.Th.U. and therms. Our contemporary also criticizes the charges for gas, in view of the cost of coal and of labour having fallen

so heavily. It does not seem to know that the price of coal delivered to many works is still 60 p.ct. and more above pre-war cost. It does not know that the wages reductions in gas industry are being made more steadily than in any other industry. It does not know how the revenue from secondary products (which revenue affects the price of gas) has suffered through industrial depression and other causes. A genius is required who will show the gas industry how to get light into the dark places of intellectual capacity in connection with the daily Press, so that the public may be better informed on this matter of therm charges than they are now. There is certainly something wanting in the industry's educational processes.

An Official Advantage.

Arising from the annual report of the Chief Inspector of Factories and Workshops, is a point upon which we incidentally touched in last week's issue, and to which we wish to refer again. It has relation to the lighting of factories and workshops. In various places in the report there appears to be evidence that the inspectors have somewhat of a bias towards electric lighting. Various references are made to that system of illumination; and in the section dealing with underground workrooms it is stated that 71 p.ct. of them are fitted with electric lamps. There is comparatively little reference to incandescent gas lighting, which, properly maintained, gives an economical and well-distributed illumination; and the light is beneficial for the workers, inasmuch as it does not produce eye strain as notoriously do lamps of higher intrinsic brilliance. The factory inspectors recognize that glare is harmful to the workers; but unfortunately they do not differentiate in any way between electric and gas lighting in this respect. Nor do they appear to realize (or, if they do, they say little or nothing about it) that gas-lamps can be made in factories to be not only good light givers, but excellent aids to ventilation. The question of economy does not apparently influence them. Incandescent gas lighting by modernization can be made to render the best of service to factory owners and workers without any great expenditure; and yet with all the indisputably good attributes of the system of lighting in which the gas industry is concerned, the inspectors seem to have a decided leaning towards electric lighting.

There is a section of the department which has supervision over the stations at which electricity is generated and the factories at which it is used. Of the former there are somewhere about 600, and of the latter 70,000. During the year covered by the report, four new inspectors—electrically trained men—were appointed to reinforce the staff of the Chief Electrical Inspector (Mr. G. S. Ram). With a department specially devoted to the inspection of electrical equipment, and the electrically trained inspectors having free entry into 70,000 factories about the country, it may be supposed that with their predilection for electrical operation (which naturally comes from their training) they may have persuasive influence—not owing to any express desire to do electricity suppliers a good turn, but from personal preference. They come into touch with responsible men in the factories; and their official position carries weight. Their participation in the work no doubt, too, spreads a certain amount of influence among the inspectors in the other sections of the department. Though gas is used in enormous volume in industry—coal gas, water gas, producer gas, and blast-furnace gas—there are no professionally trained inspectors to look after the utilization of gas in factories and workrooms. This is left to the ordinary inspectors, who have no specialized qualification in gas use, and know little technically as to its applications. Perhaps the difference is a compliment to gas. Anyway, it seems to suggest that utilization of electricity in factories without adequate supervision is attended with considerable risk. At the same time, there is the advantage on the side of those trading in electricity that official inspectors in a Government department must, in respect of lighting and power, have influence, whether or not deliberately exercised.

It is therefore for the gas industry to provide the counteractive influence. The "B.C.G.A." have done, and are doing, an immense amount of work in this direction; but this requires backing-up by the best possible efficiency in the way of local effort by gas undertakings. Unless this is done, additional factory lighting and power business will be allowed to slip from the gas industry. We have heard men connected with the manufacture of gas appliances complain bitterly of the indifference to the lighting branch of the business that they find among gas suppliers. It is the branch that requires the largest amount of protection; and yet, quite in accord with the perversity of human nature, it is the one that is permitted largely to take care of itself, and the performance is very ineffectual. It is the same with power. If all local gas undertakings were thorough in this work, and were backed-up efficiently by the gas-engine makers, the electric-motor would not have made the headway it has done, and is doing. Many steam-engines that are replaced by electric-motors would be substituted by gas-engines.

The Smoke Abatement Bill.

The Earl of Onslow has introduced in the House of Lords the promised Smoke Abatement Bill; but it does not appear to us to carry legislation much further in promoting atmospheric sanitation than did the old legislation. Practically all it does is to stiffen-up the conditions and penalties affecting the emission of smoke from factory chimneys. Domestic chimneys are left altogether untouched. They have been proved to be collectively far worse sinners in polluting the atmosphere than factory chimneys; but successive Governments appear absolutely afraid of interfering with the crude and wasteful domestic fire. It ought not to be beyond the wit of man to make a beginning somewhere in restricting the evil wrought by the combustion of crude coal in domestic fireplaces and cooking ranges. But there is the governmental disinclination to do anything, and so matters drift on in much the same way. We are not ourselves favourable to any drastic legislation; but with gas-fires and coke available, it should be possible to bring some limitation to bear on the contribution of a dwelling-house to atmospheric pollution. What is wanted is a start. Given that, labour-saving gas and special coke grates and boilers can then, without further aid, do much in contributing to progress. As indicated, the new Bill contemplates making things more stringent for factories. For instance, the owner of a chimney (not being a domestic chimney) sending forth smoke in such volume as to be a nuisance will be liable to be dealt with summarily, notwithstanding that the smoke is not black smoke. The expression "smoke" is to include soot, ash, grit, and gritty particles. The penalty, too, is to be raised from £5 to £50. The Public Health Act is to be amended in these respects, and so is the Public Health (London) Act. Furthermore, the Minister of Health is to be empowered, after such inquiry as he deems to be necessary, and after consultation with any local authorities or other interests concerned, to make Orders extending the list of noxious or offensive gases mentioned in section 27 of the Alkali Works Regulation Act, as well as the list of works mentioned in the first schedule to the Act. The general view will be that the Bill does not go far enough.

An Innovation in Financing.

In Parliament this year, there has been an extension of the statutory powers of electricity suppliers at the expense of other people. The innovation is a financial one. It is of an order which does not commend itself to independent financial experts; and its advent is much to be regretted. It is to be found in two measures, both of which (it may now be taken) will shortly receive the Royal Assent—the Electricity Supply Bill, and the South Wales Electrical Power Distribution Company's Bill. The former deals with the financing of the Joint Electricity Authorities, and the latter (among other things) with the new capital authorization of the Power Company. What the two measures do is to give statutory sanction to something that high financial opinion says is irregular and bad, but to which opinion political expediency turns a deaf ear.

Take the Electricity Supply Bill first. Power is given to raise money by the Joint Authorities for the purposes of their unifying schemes of electricity generation. Then comes the objectionable feature. Power is given to electricity undertakings—including those owned by local authorities, whether receiving or intending to receive a supply of electricity from a joint authority—distributing energy in the district: (1) To lend any money which the local authority is authorized to borrow; (2) to subscribe for any securities issued by the joint electricity authority for the purpose of raising such money; and (3) to guarantee, or join in guaranteeing, the payment of interest on any money bor-

rowed by the joint authority, or on any securities issued by them. In the first place, the borrowing of money by one authority to lend to another authority is repugnant to sound finance. The authority borrowing the money does so on the security of the local rates. After doing this, and handing it over to the joint authority, the lending council are permitted again to pledge the local rates by guaranteeing, or joining in guaranteeing the payment of interest on any money borrowed by the joint authority or on any securities issued by them! Thus the rates are to be doubly pledged for the same money. Nothing more grotesque in the way of financial legislation has ever been committed. There are certain limitations; but they do not in any way affect the pernicious principle underlying the innovation. It is enacted that the section shall not authorize the raising of money or the giving of any guarantee by any council which would involve them in an annual liability exceeding, in the case of a council who are not authorized undertakers, the amount which would be produced by a rate of a penny in the pound. In a case where the council are authorized electricity undertakers, the limitation is the estimated annual amount of any capital charges from which the council will be relieved by reason of taking a supply in bulk from the joint authority—such estimated amount to be determined by the Electricity Commissioners, whose decision is to be final. The raising of money for the purposes of a loan or for subscribing for securities is deemed to be a purpose for which a council, being authorized electricity undertakers, may borrow under the Electricity Supply Acts, and money that a council not being authorized undertakers may borrow under other General Acts.

From the ratepayers' point of view, there is considerable objection to all this. It has been said that objection on the part of the ratepayers has not been evidenced—in fact, they have been altogether passive in regard to it. But have the ratepayers generally known what new obligation is likely to be imposed upon them? They have not, and so have not had a fair opportunity for expressing their disapproval. We have already pointed one objection to the proposal. There are others. Although borrowed money may be lent by a council to a joint authority, the lending body will have no definite control over its expenditure. The joint authorities will be composite bodies, each member of which will have his own local interests to serve; and so we foresee no end to the bones of contention. This is not the same thing as a local authority expending money on its own local purposes, and having full power over the manner of spending, with no other body or locality having the right to interfere. It is the large ratepayers who have the greatest interest in this method of dealing with money for which the ratepayers are responsible, but over which their own elected representatives have only a partial, and thus no effective, control. For gas undertakings the situation is really Gilbertian. They are among the largest ratepayers in an urban area—in some cases, they are the largest. The money which the local authorities will borrow—for which the ratepayers will be responsible, and which responsibility is further increased by the transfer of the money to a joint electricity authority in whose proceedings the lending authority will have only one voice among many—will be used in competition with the local gas undertaking, which is one of the unwilling parties with the heaviest participation in guaranteeing the security of the money and the interest upon it. Nothing more fantastic can be imagined; and yet this is a serious piece of work of our Legislature this session, despite influential opposition to it.

Much the same thing applies to the case of the South Wales Power Company's Bill (which includes the Treforest Company, which is really part of the system of the former). The powers sought, and which we now know are to be given, are practically the same as those in the Electricity Supply Bill. Perhaps the case is even worse; for this is an instance of local authorities subscribing borrowed money for capital purposes to a Company whose financial record is anything but a good one. As a matter of fact, the Company are now only paying their debenture interest. It is true that the lending or subscribing of money to them is to receive the consent of the Ministry of Health and of the Electricity Commissioners. But is it conceivable that these bodies will withhold consent in view of the powers granted in a Private Act of Parliament? A number of South Wales Gas Companies opposed this part of the Bill; but without avail. The National Gas Council has also rendered considerable help in resisting these mischievous, indefensible, and (to ratepayers) unjust financial innovations, which are an admission that, in the view of the electrical people themselves and of the Government, these large generating schemes are not of themselves sufficiently attractive to realize enough capital from the public, and that therefore the aid of urban communities must be secured for them, through the local authorities, whether or not the ratepayers generally would approve, if they really understood the matter. No other public utility industry has been invested with similar money-raising powers. Why a distinction has been made in the case of the electricity industry, it is very difficult to say. And this distinction has upon it the demerit of financial unsoundness.

Master Patterns and Jigs.

The manufacturers of gas-cookers will be interested to learn that the National Gas Council will be advertising for tenders for master patterns and jigs for the standard gas-cooker as recommended by their Standardization Committee. When blue prints are available, an invitation for tenders will be issued, which tenders will have to be submitted on the form prepared by the Council's solicitors. In these circumstances, manufacturers must wait until the advertisement appears, and then they can proceed (as soon as the necessary particulars are obtained from the Council) to try to secure the honour of making the master patterns and jigs.

Gas Coal for America.

The feature of the coal-market reports for last week is the demand there has been for supplies of gas coal for America, owing to the coal strike there. Contracts have been booked-up in the Durham area, but to what quantity it is impossible to say, as the figures are variously put at from 20,000 to 60,000 tons. In these there is a difference of 200 p.ct., so there is a good margin within which to place the truth. However, it does not matter much what is the exact quantity. Whatever it is, it is sufficient to induce sellers to hold for somewhat higher immediate values, in view of the further transatlantic inquiries that are being made. The better class coals are the ones being taken. That there will be further orders is evidenced by the fact that more ships are being chartered for taking coal to America. Germany is still a buyer of gas coal—in fact, in the Durham area that country has been the best foreign customer. The American demand, however, can be only temporary; and therefore owners are making contracts for future home delivery at slightly reduced prices. The prices that have been somewhat stiffened-up are those for current delivery. In other areas there is a decided quietness; and supplies are being freely offered in the open market.

Special or Other Orders.

The Lord Chairman has given formal notice of certain amendments in Standing Orders, including the insertion of a new one, which is tantamount to an invitation for opposition, after a Special or Draft Order under the Gas Regulation Act, 1920, or the Electricity Supply Act, 1919, has been laid before the House by a Government Department. In the event of opposition, there will be reference to a Joint Committee of the two Houses, or a Select Committee of five members. When Provisional Orders were made under the Gas and Water Works Facilities Act before the coming of the Gas Regulation Act, opposition was permissible right up to the last stages in Parliament. It always seemed to us that it was a pity that opposition could not be completed in the departmental stages, so that the simplicity of the Order system should not be vitiated by abnormal expenses due to carrying opposition before Parliamentary Committees. However, petitions against Orders, it is proposed, shall be deposited, as directed, on or before the seventh day after that on which the Order has been laid before the House.

Wilton's Continuous Tar Distillation Process.

In the "JOURNAL" for May 24 [p. 443], allusion was made to a new continuous tar distillation and cracking process which Mr. Thomas Wilton, of the Chemical Engineering and Wilton's Patent Furnace Company, Ltd., has invented. It was then stated that the plant was working at the Glasgow Corporation Chemical Works, under the direction of Mr. W. A. Walmsley, the Manager, and that the process had treated and successfully

distilled a large quantity of tar, giving an average residue of only 27 p.ct. of pitch, when normally 44 p.ct. would be expected. A paper on the subject was read by Mr. Walmsley at the annual meeting of the Society of Chemical Industry; but we are only permitted to give a brief account of its contents. This we do to-day; and the results of a continuous run of the plant are reproduced. From the experiments it is evident that merely to couple together two Wilton dehydrators of similar capacity is not providing the essential means to success; and it is certain that the velocity of the tar in the second (pitch) coil has to be maintained at a sufficient point for cleaning purposes. In addition to this, we learn that a special coil has been perfected by the Wilton Chemical Engineering Company for providing an automatic scouring action. The new plant will also be equipped with automatic temperature control, and far better utilization of the available heat will be made. We understand that plants of this kind are already being ordered; and it is hoped that further results will be published when the complete and modified process has been put to work.

Unemployment Insurance.

The Federation of Gas Employers have received a letter from the Ministry of Labour from which it is seen that, subject to satisfactory evidence of the permanence of the employment, the Minister is prepared to issue renewed certificates of exception which will be valid for a period not exceeding five years.

Certificates of Exception and Exemption.

The Federation call attention to a little misunderstanding that seems to have arisen as to certificates of exception and certificates of exemption. These do not mean the same thing. It is explained that certificates of exception refer to classes of employees engaged in specific employments, among which are employees in any statutory gas undertaking. These are granted under Part 2 of the first schedule to the Unemployment Insurance Act, 1920. Where such a certificate is given, neither employer nor employee is required to contribute to the unemployment insurance fund. Certificates of exemption are granted under section 3 of the 1920 Act, and refer to *individuals*, and are given "when any employed person proves that he is either (*a*) in receipt of any pension or income of the annual value of £26 or upwards which does not depend upon his personal earnings, or (*b*) ordinarily and mainly dependent for his livelihood upon some other person," &c. Under this section, employers are liable for contributions in respect of any such employee who obtains exemption.

Summer Time.

Up to the middle of last week, the local authorities of close upon 300 areas in England and Wales, with an aggregate population of upwards of 10 millions, have forwarded to the Early Closing Association resolutions of approval of the campaign to secure the continuance next year of the full period of summer time. Several trade and business organizations have joined in the protest against curtailment.

A Spirit of Moderation.

The Miners' Federation have been holding their annual conference at Blackpool; and a feature of it has been that all through the proceedings moderate view and decision have walked over the wild men who still counsel extreme measures in the effort to secure something that economic conditions deny. We are all aware of the acute distress there is in the mining centres. It is generally known that the industry is over-manned—that there are some 100,000 men and boys without work in it because there is not work for them to do; and that in some areas pay is low because of short time through insufficient business. Had it not been for the average minimum wage of 20 p.ct. above the 1914 wages, many of the districts would have been worse off than they have been. The owners have also been badly hit. The new President (Mr. Herbert Smith) acknowledges this. He stated at the conference that the additional cost to the owners of maintaining the present wages agreement amounted to 3 millions sterling a year, which sum comes directly out of profits, reserves, or bank overdrafts. There was an attempt by certain of the representatives at the conference to terminate the wages agreement on Sept. 30. But under the influence of such leaders as Mr. Smith, Mr. Frank Hodges, and others, the conference agreed to the recommendation of the Executive not to take any such foolhardy course. The general view was that it is better to seek betterment by working with the owners than against them. This is sensible and statesmanlike. It recognizes that the prosperity of capital is bound up with that of labour. Does this, however, go far enough? What is really wanted to improve pay and employment is an augmentation of the volume of trade, which will enable the producing capacity of the mines to be operated to the fullest extent. The seven-hour day is one cause of high costs and still dear coal; and while it continues, even with all men working, the output is not likely to reach the 1913 level. One direction in which there must be reflection of the effects of lower production is in wages. Much, of course, can be done by co-operation between the owners and the men; but it must be co-operation of a very real order. The result of the decision at the conference is that there will now be an opportunity for consideration of the wages position by the National Wages Board, and without the threat of a stoppage prejudicing discussion.

Coal Output and Prices.

The "Iron and Coal Trades Review" has been investigating the coal position during the past six months. The output amounted to less than 120 million tons, or at the rate of about 240 million tons a year. Thus there is likely to be a deficiency this year of 47 million tons compared with 1913, when the output was 287 million tons. At the most, with all men working, our contemporary sees no chance of output, with the seven-hour day in operation, exceeding 250 million tons. Prices have receded somewhat during the six months. The average monthly f.o.b. price was in January £1 3s. 9d. (13s. 5d. in 1913) and £1 2s. 4d. in June (14s. in 1913).

Gas Coal Exports.

During June the quantity of gas coal exported was 663,185 tons, the value of which was £723,988, or £1 1s. 1d. per ton. In the six months, 3,848,780 tons of gas coal were exported, compared with 948,352 tons in 1921 (including the strike period), and 1,095,556 tons in 1920. These figures contrast badly with the 5,510,408 tons in 1913. The value of the 3,848,780 tons in the last six months was £4,267,693—about the value (£4,299,655) of the 1,095,556 tons in 1920.

Gas Coke Shipments.

The quantity of gas coke shipped last month was 34,175 tons, with a value attached of £46,072. The quantity shipped in June, 1920, was 68,044 tons; the value being £409,346. In the six months 327,525 tons have been exported; the value being £488,528. In the six months of 1920, 365,184 tons were exported; the value being £1,861,267!

Sulphate of Ammonia Exports.

In June, 11,563 tons of sulphate of ammonia were sent from our shores, making the total for the six months 66,712 tons, compared with 70,828 tons in the corresponding six months of 1921. France has taken nearly half the total quantity exported in the six months of this year—30,529 tons. Japan has shown great frugality in her purchases in the half year—50 tons. This is not as things were.

PERSONAL.

In the list of successful candidates who obtained degrees in the Honours School of English Language and Literature at Oxford University, appears the name of Miss MARJORIE H. CLARRY, who was a member of St. Hugh's College, and was closely connected with its social life, especially in outdoor pastimes. Miss Clarry is the daughter of the General Manager and Secretary of the Cardiff Gas Light and Coke Company.

Mr. REES JENKINS, Manager of the Coventry Corporation Gas Department's Chemical Works, has been appointed Chemical Engineer to the Sheffield Gas Company. Mr. Jenkins received his training in engineering and chemistry both in England and Germany, and has worked on coke-oven and bye-product plants in England, and since 1913 has been in charge of the chemical works of the Coventry Corporation Gas Department. During the war he was commissioned in the Intelligence Corps.

SPECIAL AND OTHER ORDERS.

Petitions by Opponents.

THE Lord Chairman has given notice of a proposal to make the following insertion in Standing Orders:

PART VII.—DEPARTMENTAL ORDERS.

(1) Where any Order (including for the purposes of this part any Special Order or Draft Order) of a Government Department is laid before this House under any provision of the Electricity Supply Act, 1919, or the Gas Regulation Act, 1920, which enacts that the Order shall not be made or shall not come into force unless it is approved with or without modifications or additions by resolution passed by each House of Parliament, petitions against the Order may be deposited in this House on or before the seventh day after the day on which the Order has been so laid; and the petitioners shall be allowed to appear and oppose as in the case of a Private Bill.

(2) A copy of every such petition shall be deposited on or before the said seventh day at the office of the Electricity Commissioners or Board of Trade, as the case may be.

(3) An opposed Order, unless it is referred to a Joint Committee of both Houses, shall be referred to a Select Committee of five for their report.

(4) If the Committee to whom the Order is referred report that in their opinion the Order shall be approved with or without modifications or additions, or should not be approved, their report shall be laid before the House, together with a copy of the Order showing the amendments (if any) proposed by the Committee.

(5) If, during a reference of an Order to a Select Committee of this House, the House of Commons pass a resolution that the Order shall not be approved, and so inform this House, the reference to the Select Committee shall be determined, and they shall report accordingly.

ELECTRICITY SUPPLY MEMORANDA.

IN the editorial and later columns of the "JOURNAL" last week, there were references to the annual report of the Chief Inspector of Factories and Workshops (Mr. R. E. Graves); and the section dealing with the generation and use of electricity in industrial establishments was left for notice this week. The Chief Electrical Inspector is Mr. G. S. Ram, whose reports are always illuminating and frank in both criticism and praise. There is no question about it that Mr. Ram is very desirous of having electricity generation and utilization raised to, and maintained at, as high a pitch of perfection as is possible. During the year under review, his department was strengthened by the placing on the staff of four additional inspectors—all fully trained electrical men; and, from what is seen in the report, this change was not made before it was wanted. There is no doubt that Mr. Ram and his staff have been labouring under the difficulty of insufficient inspecting capacity. It is acknowledged that hitherto it has been impossible to investigate many of the electrical accidents. That is a pity, seeing that the investigation of accidents is instructive as to what should be avoided or as to the protection to be given. It is also obvious, and it is confessed, that the inspection of stations and plant and factory premises has been very inadequate. This must be so with an insufficient staff for the work of inspecting some 600 electricity generating stations, with several sub-stations, and about 70,000 works where electricity is used for driving machinery and for other purposes. However, the reports from the district staffs confirm Mr. Ram's own observations that the quality of new work on factory premises continues to improve; but there are exceptions—generally where the occupier not having technical knowledge relies entirely on the contractor, who secures the order on the question of price only. While it is satisfactory to know there is some improvement in the quality of installations, the information given by the report as to accidents does not show that the improvement is as yet, all things considered, making much impression upon the reduction of the number of accidents. However, the strengthening of the inspection staff must have some good effect in making as much provision against accident as is reasonably possible.

Factories and Workshops—Strengthening Electrical Inspection.

Electrical Accidents in Industry.

In factories and workshops, the number of accidents to workers in the year due to electricity was 322, of which twelve were fatal—a reduction of 81, or 20 p.ct. on the total, and 50 p.ct. on the fatal cases, compared with each of the two preceding years. The report attributes this reduction to two causes. In the first place, it is believed that it is partly owing to the higher standard of electrical work; and in the second place it is thought probable that it is to some extent due to slackness in trade. We rather think the latter cause is largely responsible. There were three months of last year during which numerous factories were closed down or only worked partial time through the coal stoppage, and, subsequently, a very general state of industrial inactivity ruled, which meant fewer men at work, less machinery running, and shorter hours. This was reflected in the acute decline there was in the consumption of electricity for power purposes. When these things exist, naturally the area for accident is considerably restricted. Therefore the year gives no real authority for the belief that a reduction of accidents will obtain in the future. Mr. Ram recognizes this when he says: "The reduction in the relative proportion of fatal cases is also satisfactory, but cannot, I fear, be regarded as a permanent improvement, so much depending upon the chance circumstances of the accidents." There is something in the last ten words for profound thought on the part of electrical men. Another notable point is that "the reduction in the fatalities is entirely in respect of the low-pressure shock cases; there being five only as against nineteen and twenty in the two preceding years."

Distribution of the Accidents.

Examining the distribution of the accidents, it is found that twenty-one of them occurred on high-pressure or extra-high pressure distribution systems—seven of the mishaps being fatal. Seventeen, including five of the fatal cases, occurred in public supply stations—eight of them (two being fatal) were to skilled persons, and nine (five being fatal) to unskilled persons. Four of the accidents to skilled persons were due to foolhardiness in deliberately working close to unprotected live conductors, and five occurred to unskilled persons who were set, or permitted, to work in similar circumstances. The point is emphasized that the employment of labourers or other unskilled persons on dangerous work in such stations, and without proper supervision, is still far too prevalent. The other four accidents to skilled, and two of those to unskilled, persons were due to mistakes on the part of those in charge of the work in erroneously supposing that the conductors had been isolated and made dead. In this class of accident (many of which have occurred in previous years), the result, when not fatal, is often serious permanent injury. Of the low-pressure and medium-pressure accidents, a large proportion (70) was, as usual, due to persons, both skilled and unskilled, cleaning or repairing live switchboards or other apparatus. Attention is drawn to a fatal case, involving an increasingly widespread risk. This refers to the use of the screw-socket type of lampholder. When used, as was always the case up to a few years ago, with lamps fitted with screw caps which entirely entered the screw socket, there was no objection. Recently, however, lamps, both of small and large sizes, are made with a metal extension of the screw cap in the form of a cup covering the neck of the lamp, and extending far outside the screw socket of the holder. It is invariably overlooked that this exposed extension of the screw cap is in electrical connection with the circuit, and is live, and may be dangerous to touch. In the case in question, a man was attempting to remove a lamp from the holder, took hold of the metal cup, and was killed. This accident occurred on the premises of an important electrical power supply undertaking, where one might expect that the installation would have been correctly carried out. A table analyzes the conditions under which the twelve accidents occurred. Suffice it to say that in the case of three of the accidents the "probable voltage of shock" is put at 250, one at 230, and one at 220.

Uncomfortable Predictions.

It is highly interesting to read the contradictory opinions of our electrical contemporaries as to the Electricity Supply Bill. "Electrical Industries" clearly does not think much of it. It is going to be an instrument that will cause all sorts of bickering and other disturbances in the electrical industry. It has had a very bad character from its birth; and this, it seems, is likely to develop with time. We are rather inclined to agree with our contemporary. The measure introduces new and untried phases into the electrical system which will give much scope for local jealousies and discontent. Our contemporary is analytical. It has examined closely the multitude of amendments that were proposed to the Bill. This revealed to it that the old conflicting interests are not dead, but are as lively as ever; and it is therefore dubious as to the Bill, when it becomes an Act, bringing about any "greater harmony of purpose." This is the picture of the future that it presents: A Joint Electricity Authority armed with financial powers will find itself compelling individual undertakings to proceed with policies which may or may not suit them; it will also be in the position of levying contributions not only for administrative costs, but for losses on the operation of joint schemes. There is the further uncomfortable prediction that, with a joint electricity authority controlling both engineering and finance, the individual undertaking will have far less freedom than it enjoys to-day. The picture is not a nice one, particularly when we are reminded that the amendments which it was urged should be made in the Bill declare how strong is the opposition to the measure in every section of the industry. This is not a good start for the application of the powers conferred upon the joint authorities and urban councils.

Another View.

The "Electrical Review" presents us with another opinion upon the measure. It asks the questions: "How do we stand now?" "What is the gain or the loss to the industry?" "Will the industry be better or worse off?" The "Review" is optimistic. It says: "Fortunately, we can reply to these questions with confidence; the passing into law of the Electricity Supply Bill will

be thoroughly to the good of the industry. The uncertainty of the last two years or so as to what the second Bill was to contain has had almost a paralyzing effect on the industry. Now that uncertainty is laid to rest for good." But the transition from uncertainty to certainty as to the contents of the Bill does not mean that it is going to compose all difficulty in the electricity industry, nor that it is going to work wonders in promoting the industry's advance. However, our genial contemporary opines otherwise. "The contents of the Bill are good." That is emphatic. For all the good that it sees in the measure, it accords thanks to the Electricity Commissioners. They have provided the purseless joint electricity authorities with financial powers; and these are now so hedged round with safeguards that the bogey of "municipal extravagance" can no longer haunt even the most sensitive minds. Why "bogey?" Has "municipal extravagance" in many places been only a bogey, and not a reality? There has been too much that is material about the extravagance for most intelligent people to view it in the light-hearted manner of our contemporary. But it is to be avoided in future; there is to be no more of it—so thinks our contemporary, with vision restricted to a nose length. Doubts as to the end of extravagance are widespread. People find something new in the position. They see local authorities lending considerable sums of borrowed money (for which the ratepayers are responsible) to joint authorities over whom no individual lending authority has complete control, and yet the ratepayers are to guarantee loans and interest. Our contemporary's idea is that everybody should be pleased; but everybody is not pleased, and is not likely to be. It gives unstinted thanks to the Electricity Commissioners; none to Parliament. It is sure "the industry cannot express its appreciation more to the satisfaction of the Commissioners than by taking full advantage of the provisions of the two Acts (when the Bill is finally passed) to reorganize and develop by way of mutual co-operation." We shall see.

Increases in Consumers and Consumption.

The deeper the development of the electric lighting business is carried into new strata of householders, the more pronounced becomes the gulf between the percentage increase of consumers and the percentage increase of business done. The operations of the Leeds Corporation Electricity Department for last year illustrate this. The total sales of current for the year receded from 62,921,813 units to 58,826,215 units—a fall of 7·97 p.ct. This may be said to be wholly due to the power consumption. There was an increase of about 15 p.ct. in the number of lighting consumers, but of only 3 p.ct. in the sales of current to such consumers. There is a wide difference between the 15 p.ct. and the 3 p.ct. It is stated that the percentage increases in the number of consumers and of the sales of current for heating purposes have been much greater; but of course, the lower the basic figures, the greater will numbers appear as percentages.

Water Heating and Cost.

Last week we commented on an article, treating of electric water heating, by Mr. G. H. Wood, that had appeared in the "Electrical Review." In this the writer asserted that electricity at 1½d. per unit could compete with gas at 4s. 6d. per 1000 c.ft. We showed that Mr. Wood was altogether adrift in this matter. We will not repeat what was then said. But we note that Mr. C. Orme Bastian has also administered a rebuke to Mr. Wood. We have on occasion crossed swords with Mr. Bastian; and so we are pleased to see his attitude in this matter, if we are not totally in agreement with him. Calling attention to the statement that electricity at 1½d. per unit can compete favourably with gas at 4s. 6d. per 1000 c.ft., Mr. Bastian says at these prices 1½d. would purchase 27¾ c.ft. of gas, yielding 13,875 B.Th.U., which is more than four times as much heat as can be obtained from one unit of electricity also costing 1½d. Taking the calorific value of gas as 500 B.Th.U. per cubic foot, he remarks that the truth is that the price of electricity must not exceed ½d. per unit in order to compete with gas for water heating at 4s. 6d. per 1000 c.ft. In his opinion there can be no very general demand for electric water-heaters until electricity supply authorities can see their way to charge ¾d., or less. It is always best to face the facts; and it can be proved, remarks Mr. Bastian, that one B.Th.U. electrically applied will heat the same amount of water in the same time, and to the same temperature as 1⅓ B.Th.U. applied by means of a coal-gas flame. This depends not on Mr. Bastian's assertion, but on how the coal-gas flame is applied.

Small Causes and Big Effects.

Electricity supply interruptions are often the result of small causes. The newspapers tell us that the other night a rat crawled along a narrow pipe at the electricity station at Rochdale. It caused a short circuit, which completely cut-off for some time the lighting in all the Lancashire towns supplied by the Lancashire Electric Power Company's system, with which the Rochdale undertaking is linked-up. On examination, the rat was found electrocuted. We are not surprised.

Mr. W. S. Curphey, late Chief Inspector of Alkali Works, has left estate of the gross value of £2486.

THE NEW LONDON COUNTY COUNCIL HALL.

A Large Gas and Steam Cooking Equipment.

ON Monday last week, His Majesty the King "opened" the princely buildings which the London County Council have constructed, on the south side of the Thames, close to Westminster Bridge, in which to conduct the vast work of the chief governing authority of London. It is not our business to describe in these columns the constructional work of this piece of enterprise; but there is one part of the equipment system which has an immediate interest for our readers—that is the kitchen and service arrangements.

The kitchen is naturally of a very extensive character, as in it cooking has to be conducted for a staff of 2000, in addition to the meals served in the members' refreshment room and the ladies' refreshment room. The kitchen is on the seventh or top floor, in the concave or semi-circular portion of the building facing the river front. In view of the shape of the building and the extent of the refreshment rooms, the kitchen is very long and narrow. It should be mentioned that a large portion of the cooking apparatus is being transferred from the temporary kitchen which was fitted up during the war.

The whole of the cooking will be done by gas and steam, and no coal fire or electric appliances are used. The whole of the roasting, baking, frying, grilling, toasting, and a considerable portion of the boiling, will be performed by gas.

The fittings which are being transferred include several large gas roasting-ovens, to which have been added one large two-compartment gas roasting-oven and one large double decker gas pastry-oven. One gas fish-frying apparatus, with two pans, is being refixed in the new kitchen, and a new one is being added. There are a number of gas hot-plates and stockpot stoves which are being transferred; and two large additional gas hot-plates are being added, with special treble ring burners, and in each case with a steam-pad shelf fitted over for keeping food hot. Most of the boiling will be carried out in four new steam-jacketed boiling pans; but there are also two gas-heated pans which have been established for emergency. The potatoes, puddings, and fish will all be cooked in steam-ovens.

The service-rooms for the staff dining-rooms are on the sixth floor—one at each end of the kitchen. The fittings in these are mainly hot closets with plain tops, service counters, and tea and coffee apparatus; and so far as possible, the principle has been observed that, in case of a coal strike and the steam-boilers being out of use, the work could be carried on with gas only, while in the possible event of a shortage of gas, the work could still be performed by steam only. Thus, the fittings are fairly equally divided between the two methods of heating. The water-boilers for tea making are on Benham's "Continuous" principle.

The service-room for the members' refreshment room is fitted-up in much the same way on the first floor, adjoining the dining-room, and a similar service-room has been equipped next to the ladies' refreshment room for serving teas, &c., in that room.

The contract was naturally a very large one, and, after keen competition, was secured by Messrs. Benham and Sons, Ltd., of No. 66, Wigmore Street, London, who have carried out many contracts of a similar nature. In this one they have maintained their reputation for excellent work.

Dimensions for Malleable Iron Pipe Fittings.

The British Engineering Standards Association have just issued two new reports, Nos. 143 and 154, dealing with dimensions for malleable and soft cast-iron pipe fittings of nominal sizes from ⅛ in. to 4 in. Both the reports contain, among others, clauses relating to special sizes of reducing fittings, screw threads, and the method of specifying outlets. These are followed by tables of dimensions of British Standard Equal and British Standard Reducing Fittings, and the reports conclude with type drawings of the fittings, together with a diagram indicating the method of setting-out the curves of the reducing fittings. The reports include also special tables by means of which the "centre-to-face" dimensions for reducing fittings can readily be ascertained—a most useful feature both for the manufacturer and the installation engineer. Report No. 143, "British Standard Dimensions for Long Sweep Type Malleable Iron Pipe Fittings for Steam, Water, and Gas," is limited to fittings designed for use where the maximum "delivery head" is needed, and where the question of frictional resistance is important. The fittings dealt with are bends, elbows, tees, and crosses. Report No. 154, "British Standard Dimensions for Malleable and Soft Cast-Iron Pipe Fittings for Steam, Water, and Gas," includes all fittings in general use—such as sockets, caps, elbows, hexagon nipples, return bends, tees, and crosses. The Secretary of the Association (Mr. C. le Maistre), of No. 28, Victoria Street, S.W., points out that these fittings are considered to be suitable for use in ordinary house lighting and water installations, and that therefore they may be of interest to the general public.

A summer visit has been arranged of the Society of Engineers to the Old Kent Road Works of the South Metropolitan Gas Company. It is to take place on the afternoon of Monday, Sept. 11.

SOUTHERN ASSOCIATION AT LUTON.

With the Davis Gas-Stove Company and at the Gas-Works.

Favoured by what one member was heard to term "Southern Association weather"—that is, a really fine day—a visit was paid last Wednesday by the Southern Association of Gas Engineers and Managers to Luton, where a busy and thoroughly successful day was spent, the first part at the works of the Davis Gas-Stove Company, and the afternoon at the gas-works. Judging by remarks made during the proceedings, the morning's programme was an innovation for this particular Association; but, if that be so, it forms a precedent which will doubtless be followed as occasion arises. A party of some 35 members, with the President (Mr. J. M. Campbell, of Margate), and the Hon. Secretary (Mr. W. H. Bennett), travelled down together by an early train to Luton, where they were met by motor coaches, which took them to the scene of their first inspection.

THE DAVIS GAS-STOVE COMPANY'S WORKS.

On arrival at the Davis Gas-Stove Company's works, the visitors were taken in hand by Mr. Harold N. Davis and Mr. Cyril G. Davis (Managing Directors), Mr. F. Blackwell (Works Manager), Mr. W. R. Twigg (Technical Manager), Major F. Cornelius Wheeler (Manager of the Nautilus Fire Company), and other members of the staff, whose welcome was of the warmest. First the celebrated bowling green was passed, and then the hard tennis court, both, surrounded by flowers and in the bright sunshine, appearing ideal places in which to spend one's leisure hours. But there were no "leisure hours" on Wednesday morning. Much ground had to be covered, and in order to get through in scheduled time a prompt start was necessary. In fact, so early was the start that the processes had to be taken somewhat out of their proper rotation, in order that it might be possible to visit the foundry after casting had commenced. This, however, did not matter; for so full were the explanations and demonstrations given that everything was made clear.

At the time of the visit of the Eastern Counties Association to the works three months ago, some particulars were given in our pages [see "JOURNAL" for May 3, p. 260]; and it is unnecessary to repeat these now. It may, however, be said that one proof of the good lay-out of the works is that everything goes forward, from start to finish, so that handling is reduced to a minimum. The excellence of the castings was generally remarked upon; and it was explained that every trouble is taken to ensure this good quality, right from the beginning. The pig iron is most carefully analyzed, to see that it contains the proper ingredients, before it is used in the works. This is the foundation of good castings. Then the utmost pains is bestowed upon the selecting and mixing of the sand. These two factors are of the greatest importance. It was seen that the works are thoroughly busy, but on so spacious a scale is the place arranged that the parties could examine everything without in any way interfering with the ordinary occupations of the employees. Cleanliness and tidiness are watchwords of the firm; but there are many other ways also in which the welfare of those engaged in the works is studied, for the belief is rightly held there that the better are the conditions under which men work the better will be the results attained by them. This is another reason for the good work.

During the tour, opportunities were afforded at different points of inspecting all the newest Davis specialities—and a goodly array they made. Polished gas irons and geysers fit for a drawing-room, and cookers (with enamelled plates that have the exact appearance of tiling) that it would almost seem a shame to hide away in the kitchen, mingled with fires of all sorts and descriptions, suitable for every conceivable position. In this connection, the Company drew attention to the vast difference between a cooker sent out in 1882 and one of their latest productions. The two cookers were placed side by side for inspection; and a study of them should have been sufficient to convince of the error of his ways anyone who might be inclined to question the progress made in gas-cooker design during the past forty years. It was difficult to believe that the armour bright fires on view were made of cast iron and not steel; but the reason for this wonderful effect has already been indicated. The laboratory arrangements are complete, and, as was seen, the treatment of the sand used is of itself an elaborate process. Referring to core making, in which women are expert, the visitors were pleased to have an opportunity of chatting with Mr. Day, a blinded ex-soldier, who (formerly a skilled moulder) is now an adept, too, in this class of work. It is gratifying that his old employers should have been able to find him a place in this line of work. Indeed, the Davis Company were really patriotic during the war, for they encouraged every possible man to join-up, and looked after their wives and families while they were away.

The inspection completed, the party, numbering well over forty, sat down to lunch in the large recreation room.

The PRESIDENT said it was his great pleasure to propose a most cordial vote of thanks to the Davis Gas-Stove Company for the hearty reception given by them to the Association, and to Mr. Harold Davis and Mr. Cyril Davis for not only having made the visit possible, but for having made it the great success which it had been. They were also not unmindful of all that had been done by the various members of the staff, who had been assiduous in imparting the greatest possible interest to the inspection. He would like to say, before proceeding further, how delighted the members were to have with them again their Hon. Secretary, Mr. W. H. Bennett, who had unfortunately been unable to take part in the visit to Margate. He had had a very trying illness since; but they hoped he was now on a fair way to recovery. With regard to the present visit, he thought that, in one way, the Davis Gas-Stove Company were certainly to be congratulated; for this was the first time in the history of the Southern Association that they had officially visited the works of any contracting firm. It was true that last September, when they were at Bath, the members had the opportunity of going to two works, but this was as an alternative to visiting the gas-works, which was the special function of the occasion. The Association were also to be congratulated upon the departure that had thus been made, and he was pleased that it had taken place during his year of office. He thought he could promise them another departure later on. They had never had a summer meeting in the section other than that to which the President for the time being belonged; but he hoped that there would be one at Exeter next September. As to all that they had just seen, he had been very much impressed with the condition of the works generally. The foundry was one of the nicest he had ever seen. It was extraordinarily roomy and light, and everything possible was done to minimize and facilitate the travel of the molten metal. The excellence of the castings and the wonderful enamelling were only two of the features of the works which spoke volumes for the Davis Gas-Stove Company. In examining the core-making process, they had all been struck by the fact that the services of a blind soldier had been utilized in this connection. ["Hear, hear."] The ease with which he produced his patterns was marvellous. It was very gratifying to know that a man who had served his country as this man must have done had been so treated by his employers. Referring to the question of the standardization of cookers, he thought it must be very comforting to the stove manufacturers to know that the Committee who had gone so exhaustively into the matter had arrived at the conclusion that there was no alteration of a drastic kind to be made in the standard cooker. This showed that the makers were reaping their reward for the great care they had given to the design of gas appliances. They had all been agreeably surprised by the recent notification from Radiation Ltd., with regard to the reduction of 5 p.ct. in their prices. They were delighted to have this reduction. It had been very difficult for gas undertakings to push the sale of appliances in the way they would have liked to have done; and in this direction the 5 p.ct. would help them a little, at all events. He went on jocularly to remark, with regard to the Radiation Ltd. rebate, that this seemed to be based on the unusual principle that the more extravagant one was the greater would one's reward be. The larger undertakings were bound to have their appliances at a cheaper rate ultimately, by reason of the rebate, than the smaller ones; and therefore it would seem that the value of the article varied directly with the size of the undertaking. Personally, it was a great treat to him (the President) to visit Luton again. He went there a considerable number of years ago as a raw youth from Glasgow, for his first appointment on a gas-works.

Those present having signified by their applause complete accord with the thanks voiced by the President,

Mr. CYRIL G. DAVIS said it was very kind of the members to so express their appreciation of the visit. On their part, the Davis Company were very gratified to know that the Association had felt it worth their while to come to Luton. If this was the first time that the Southern Association had ever officially visited a manufacturing concern outside their own particular sphere, he thought perhaps they had been a little bit behind the times. Progress was necessary in all directions; and he felt it was good for gas engineers to visit the works of some of the people with whom they were doing business. Otherwise goods might be offered to them, and possibly business might be given to firms with whom, though their price might be a little lower, the buyer would in reality be paying more for what he got. This would not be likely to happen if they had had an opportunity of thoroughly understanding all that was involved in the production of a first-class article. Therefore he felt that it was to the interest of all that gas engineers should occasionally wander outside their own particular sphere, and so get an insight into the methods of manufacturing the goods they were purchasing. Gas undertakings to-day sold the bulk of their gas through cooking and heating stoves; and the more the stove manufacturers could progress, the better it would be for the undertakings. Therefore, gas undertakings should encourage progressive firms by every means at their command. The Davis methods, as they had seen, were not in any way rule-of-thumb methods. The greatest care was taken to see that all materials employed were of the best, and that each process was carried out in the most perfect manner possible. Therefore they did feel that they were able to produce articles of good quality. In fact, were they not able to do so, they would not be in the position they occupied to-day, because, after all was said, it was quality that counted. As to the Radiation Ltd. circular announcing a price reduction, was it not obvious to them all that it was equally as bad for the makers as it was for the gas undertakings to sell goods at high prices? As far as Radiation Ltd. were concerned, they were always doing their utmost to get their goods down in price, and as soon as they could reduce costs lower it was their intention, for their own profit, to sell cheaper. They had big works, and must have these big works going all out; and they could not do this unless they were able to tempt buyers. Prices to-day were exceedingly high, and it was up to them all, if they wanted to make their business a success, to produce more cheaply. He hoped there would be a good many more intimations of a natur-similar to that which had been recently made. He again assured them that the Company were delighted to have their visitors with them.

Mr. HAROLD N. DAVIS also declared that the Company's thanks were due to the Association, and not the Association's to them. Unfortunately, there always seemed to have been a great gulf fixed between the gas engineering profession and the gas engineering trade. Personally, he had never quite been able to understand why it should have been so. He hoped, as a result of their visit that day, the members would realize that, while science entered very largely into the gas engineering profession, it played an equally important part in the manufacture of the appliances which were essential to the use of gas. The Davis Company were very proud of their works. It had always

been their ambition to keep them up-to-date, clean, and well organized, and with the best and most comfortable conditions for the men working therein. Gas engineers employed workmen in exactly the same way as manufacturing firms did, and he was sure they would agree with him that, if one wanted to get the best out of a man, it was necessary to make him contented and happy. The Company had, he thought, been successful in organizing a well-equipped works, and in making them as clean and comfortable as a works of this description could be. They had also endeavoured to find social and athletic recreation for the employees after their work, and the efforts thus made had been appreciated. The Davis Social and Athletic Club was purely a democratic institution. It was run by the men themselves, who had to make it a paying proposition. He thought it was very largely on this account that the Club had been so successful.

Mr. W. H. BENNETT said he would like to thank the writers for the many letters of sympathy which he had received during his illness.

Mr. PERCY ALDEN, speaking as one outside the Association, said he had very much enjoyed his visit, and had been particularly pleased to find that the men and women engaged in the works were so happy, and that such efforts were made to secure their welfare. He believed that the future of all industrial undertakings in this country depended very much upon good relationships between employers and employed. What he had noticed there was that, whenever the Company were mentioned by the employees, it was with a note of appreciation.

Mr. WILLIAM PHILLIPS briefly assured the members of a cordial welcome at the gas-works.

THE GAS-WORKS.

After lunch, the members were driven to the works of the Luton Gas Company, where, under the guidance of Mr. William Phillips (who some little while ago succeeded his father, Mr. W. R. Phillips, as Engineer, Manager, and Secretary) and his Assistants, Messrs. J. Simpson and R. Summerson, they were afforded an opportunity of seeing the whole of the plant. The principal features of interest here were the installation of Woodall-Duckham vertical retorts and the "Venturi" station meter; and the inspection was rendered additionally valuable by the fact that both vertical and horizontal retorts were seen undergoing repair and renewal.

In the vertical section of the works, there are coal stores of 3000 tons capacity, consisting of a steel-framed building and brick filling, with reinforced concrete division wall. They are alongside the retort-house, so that it can be filled by means of shoots from the overhead gangway in the retort-house used for filling the retort-bunkers. Tunnels are provided under the stores for emptying. There are sixteen retorts on the Woodall-Duckham system, eight of 5 tons and eight of 7 tons per day nominal capacity (the latter now being repaired), contained in a steel-framed house with brick filling. They produce, with steaming, about 1½ million c.ft. of 450 B.Th.U. gas; the temperature of the combustion chambers averaging 1250° C. This will be raised to 1300° on the 7-ton retorts, when the repairs are completed. Coal and coke is elevated by means of hydraulic lifts.

Other plant in this section includes two annular and two Walker water-tube condensers. One Waller exhauster of 40,000 c.ft. and one Donkin of 60,000 c.ft. per hour deal with the gas on this section; and two hydraulic pumps, double-acting, of Hayward Tyler's make, with accumulator, supply the lifts with water at 1000 lbs. per sq. in. pressure. The washers consist of two Holmes rotary type, and one Livesey. Four purifiers 20 ft. square and three 18 ft. square divide the gas between them, and are followed by two catch boxes of 25 ft. by 20 ft. The station meter is of 40,000 c.ft. per hour capacity.

In the horizontal section, coal stores capable of storing 9000 tons of coal are arranged convenient to the sidings, which are connected with the G.N. and L. & N.W. branch line running from Hatfield to Leighton Buzzard. Two retort-houses containing fifteen settings of sixes 21 in. by 15 in. by 9 ft. 6 in. long and fourteen settings of sixes 21 in. by 15 in. by 20 ft. long respectively, all on the regenerative system, are capable of dealing with 162 tons of coal daily. The condensers consist of one set of annular and two sets of water tube. There are three sets of exhausters, one 50,000 c.ft. and one 75,000 c.ft. per hour machines of Bryan-Donkin manufacture, and one 100,000 c.ft. per hour of Waller's make, all steam driven.

The washers are made-up of one "P. & A." tar extractor, one Livesey washer, and one Kirkham and one Holmes mechanical scrubbers. The purifiers are in two sets. Four boxes, each 30 ft. by 40 ft., fitted with greased hemp jointed covers, are worked in backward rotation; the current being reversed from upward to downward or *vice versa*, as necessary, by means of a Milbourne reversing valve; and four boxes, each 25 ft. square, are used as catch-boxes. Station meters of 60,000 c.ft. and 100,000 c.ft. per hour respectively, installed in the same house, are run in sequence for purposes of comparison; the former being of the usual type, and the latter on the "Venturi" principle, made by Messrs. Geo. Kent, Ltd., of Luton and London. Much interest was manifested in this "Venturi" meter. As stated, it is of 100,000 c.ft. per hour capacity; but the capacity of these meters can be varied merely by changing the size of the throat. If a new meter were installed on this principle, and it was anticipated that the load would be increased, provision could be made for easily putting in a different throat. The meter at Luton, which was installed some years ago, is stated to measure accurately down to one-tenth of the maximum quantity; but the latest makes are correct down to one-fifteenth.

There is a Humphreys and Glasgow carburetted water-gas plant, of a capacity of 400,000 c.ft. per day, with condenser, relief holder of 160,000 c.ft. capacity, tar extractor, and exhauster—the last named passing the gas into the stream from the horizontal retorts at the inlet to the purifiers. At present 1 gallon of oil per 1000 c.ft. of gas is used in the carburetter. Steam at 100 lbs. pressure is produced by Lancashire boilers, fitted with Goodrich and Hamlyn forced draught.

Three guide-framed holders, each contained in a steel tank mostly above ground, are capable of storing 324,000 c.ft., 750,000 c.ft., and 1,100,000 c.ft. respectively—a total of 2,200,000 c.ft., or about 90 p.ct. of the average winter day's consumption. The tank of the largest holder is wholly above ground, and supported on a reinforced concrete raft on made-up ground. Tanks of 124,000 gallons capacity are provided for liquor storage, some of brick and puddle, and others of brick and cement rendering with reinforced concrete top. A sulphate plant of the usual type, fitted with an enclosed saturator and steam ejector, deals with about 30 tons of liquor per 24 hours; the waste gases being purified by means of oxide of iron.

Gas from the verticals joins up to the horizontal retort gas at the governor-house, where all gasholders are controlled by valves on two boxes; one main inlet and one main outlet. Consequently a change of holder is immediately effective in the test-room, which is situated at the offices in Dunstable Road. There are three governors respectively 15 in., 18 in., and 24 in., and pressures vary from 30-10ths to 45-10ths on weekdays, and 55-10ths on Sunday mornings—the time of heaviest consumption, amounting to as much as 250,000 c.ft. per hour for two hours. Storage holders are provided for sampling each quality of gas produced, and a Simmance-Abady recording calorimeter gives a continuous record of the gas supplied on the town. A "Sigma" B.Th.U. indicator is used for testing and observing the gas made by horizontals or verticals.

Tea was provided at the works; and before leaving, the President acknowledged the kindness shown the Association by Mr. Phillips and the Gas Company. Mr. Phillips, in reply, said this was the first time they had had an Association at the works, so far as he could remember; but, after his experience that day, he hoped it would not be the last.

A MANCHESTER GAS DEPARTMENT EXHIBIT.

An interesting display of gas appliances exhibited by the Manchester Corporation Gas Department was the chief attraction at the Housing and Health Exhibition recently held in that city, where a continual stream of visitors were shown the many different types of the latest apparatus. The display was carefully arranged, and shown in four sections.

WATER-HEATER SECTION.

Automatic geysers and various kinds of water-heaters came in for a great deal of attention, resulting in remarks of surprise being passed at the efficiency of the apparatus during the demonstrations given with a large geyser having an automatic meter attached. This proved to an interested audience the low cost of heating water by these methods for warm baths at a temperature of 100° Fahr., or a hot bath at 110° Fahr.

COOKER SECTION.

The all-gas kitchen provided many of the latest labour-saving devices, including an ideal kitchen equipment with cooker, gas-fire, circulator, and incinerator fixed in a tiled recess, in place of the coal-range. The whole was carefully explained by the official in charge, after which the public no doubt realized the cleanliness of gas methods and the benefits bestowed by such apparatus.

FIRE SECTION.

Some very fine examples of fires were fixed amid suitable surroundings, with the simple-hire prices clearly marked. The public were asked to anticipate the depth of winter, and have all the gas-fires they required installed now, because they could not be put-in at a minute's notice, even with the best intention and best organization in the world, as the demand increases every winter.

AIR-POLLUTION SECTION.

This offered a very instructive display of apparatus and diagrams, showing the ill-effects of smoke upon the atmosphere, and at the same time explaining the beneficial results of using smokeless fuels.

Over 250 articles were sold, keen interest being shown by the very numerous visitors. Also the inquiries received during the frequent demonstrations gave evidence of good business resulting, ensuring a greater output, and thus the effective rendering of a larger public service.

Mechanical Handling and Storing of Material.—From Messrs. Crosby Lockwood and Son there has been received a copy of the third edition (thoroughly revised), with over 1100 illustrations, of "The Mechanical Handling and Storing of Material," by Mr. George F. Zimmer, Assoc.M. Inst.C.E., with a foreword by Sir John P. Griffith, M.A.I., M.R.I.A. The price of the book (which will be noticed more fully in a later issue of the "JOURNAL") is £3 3s. net.

THE SOCIETY OF CHEMICAL INDUSTRY.

TAR DISTILLING.

By W. A. WALMSLEY.

Before the Chemical and Engineering Group of the Society, at the Annual Meeting in Glasgow from July 4 to 11, Mr. W. A. WALMSLEY, the Manager of the Glasgow Corporation Chemical Works, read a paper on "Tar Distilling." The following is an abstract and the ensuing discussion.

The author gave figures from two separate works, one distilling horizontal-retort tar, and the other distilling vertical-retort tar, to illustrate the difference in specific gravity, percentage of volatile products, and percentage of pitch obtained, during the primary or crude distillation of the tar. He sketched the methods adopted in tar distilling, and then described in more detail the type of plant employed, and its lay-out, at the Provan Works of the Glasgow Corporation, of which he is Manager. These works were designed with a view to obtaining a straight flow-line through them, the waste materials travelling to one end and the finished materials to the other. The causticizing portion of the carbolic-extraction plant is of interest in that the system is continuous. It comprises two Dorr reaction agitators and two Dorr thickeners, with a Harding conical ball-mill, in which the lime is ground and slaked, and an Oliver continuous rotary filter for filtering the waste calcium carbonate sludge. There is also a Scott's evaporator for concentrating the caustic soda. The stripping of naphthas from light oils is carried out in two Wilton oil-topping plants, each of 10,000 gallons capacity per day. Three types of column were described in the paper—viz., the column packed with Lessing rings, the bubbler type of column, and the Kubierschky spraying column.

In Glasgow, the Corporation have four chemical works for the treatment of tar and ammonia. Three of these were taken over from private contractors two years ago. It was necessary to lay down some working-scheme; and the author decided to continue crude distillation of the tar at three of the works, and concentrate on one—viz., Provan—for all refining purposes. It is, he pointed out, obviously more economical in regard to manufacturing costs, and also in regard to capital outlay, to have one really good refining plant, than to put down four. Another most important point is that there is only one staff of chemists looking after refining operations, and it is therefore easier to turn out a standard product.

Among other work described by Mr. Walmsley was a continuous tar distillation experiment at the Dalmarnock works, using all vertical retort tar. The object of the experiment was to see if it was possible to run two "Wilton" dehydration coils with a small final steaming still of about 500 gallons capacity as a continuous tar distillation plant, to produce pitch of merchantable quality.

The crude tar was dehydrated in the usual way in the first coil. It was then pumped through the second coil (which was maintained at considerably higher temperature, but at a slightly lower pressure than No. 1) and released into the second vapour chamber. The residual tar then ran by gravity into the final steaming still (which was kept hot by waste furnace gases from coil No. 1), where it was subjected to steam distillation with superheated steam. The outlet from the steaming still could be raised or lowered to give longer or shorter time for steam distillation as might be required, while the thick tar was passing through continuously to the pitch coolers.

In the first experiment the temperature of the tar leaving the second coil was maintained at 280° C. at a pressure of 25 to 30 lbs. per sq. in.; and a very soft pitch was obtained. The temperature was then raised to 300° C., and then to 320° C. at the same pressure. The resulting pitch twisted at 80° to 90° Fahr. The temperature was finally raised from 350° to 360° C., and a good medium soft pitch twisting at 124° Fahr. was obtained.

Total tar distilled	32,660 gallons = 158 tons.
Duration of test	88¾ hours.
Fuel used at No. 1 coil	9 tons.
" " 2 "	10 tons 12 cwt. 2 qrs.
Total fuel used	19 tons 12 cwt. 2 qrs.
Fuel used per ton of tar distilled	2·48 cwt.
" " 1000 gallons on No. 1 coil	617 lbs.
" " " " 2 "	730 "

Rate of working:

1st 24 hours	..	330 gallons per hour	(10,000 gallons per 24 hours
2nd 24 "	..	380 " " "	= 416 gallons per hour).
3rd 24 "	..	370 " " "	
Last 12 "	..	245 " " "	

No difficulty whatever was experienced, and the object of the experiment having been accomplished, interest shifted to the possibilities of cracking, as larger volumes of oil than usual had been obtained along with a reduced quantity of pitch.

Vertical-retort tar is really a mixture of high and low temperature tars; the low-temperature portion being essentially paraffinoid in nature, the phenolic compounds of complex composition containing polyhydric phenols with possibly paraffinoid side chain linkings. Under the conditions of the experiment, the breakdown of these complex phenolic compounds was thought to be highly probable, and gave rise to interesting speculations as to whether breakdown to simpler phenols and paraffins would take place, or possibly polymerization with formation of resinous substances.

A second experiment, over a longer period, was undertaken, in order to confirm the results obtained in the first experiment. Unfortunately, owing to shortage of tar, the experiment had to be stopped at the end of the fourth day. Some time during the night of April 6, they came on to very watery tar, containing up to about 30 p.ct. of water. The results have therefore been summarized up to 6.50 p.m. on that day, up to which time tar containing a normal percentage of water had been used:

Tar Distilled up to 6.50 p.m. April 6, 1922.

22,664 gallons of dry tar.

OILS MADE.

	Gallons.	Sp.Gr.	
Crude naphtha	1,351 at 50° C.	0·905 =	5·46 tons
Middle oil	16,338 at 60° C.	0·970 =	70·7 "
Heavy oil	830 at 20° C.	1·043 =	3·88 "
			80·04 " = 73 p.ct.

Pitch and loss by difference = 27 p.ct. of tar distilled.

In the normal course of working, the yields of oil and pitch are respectively 56 to 58 p.ct. of oils, and 41 to 43 p.ct. of pitch.

The experiment is obviously not complete without an analysis of the oils produced; and at the time of writing the paper, this had not been carried out.

DISCUSSION.

The CHAIRMAN said the author was in charge of the tar-works of the Glasgow Corporation, and the ammonia plant as well. Most of them had had the opportunity of seeing what had been done at the tar-works, and were delighted to have heard his account of it. At the moment, all he would say was that he had been impressed by the manner in which the plant had been arranged.

Mr. F. NICHOLLS asked if the author dealt with his horizontal and vertical retorts separately or together.

Mr. WALMSLEY said the two types of retort were dealt with together. In a very short time he would not have many horizontal retorts. As three of the gas-works would be on verticals and only one on horizontals, they had not bothered to separate them.

Mr. R. MACLAURIN said the first point he wished to raise was the necessity for much better nomenclature with regard to different tars. It was not sufficient now to discuss tar as coal tar. There were high-temperature tars and low-temperature tars. Even this was not sufficient; and we should require to define tars as high temperature tar, semi-high temperature tar, medium tar, semi-low temperature tar, and low-temperature tar. There were very big differences between them; and the paper had indicated what some of these differences were. The ordinary horizontal tar was rightly designated high-temperature tar. The author had described vertical tar as mixed tar; and this, again, he thought was correct. But in the main it was really a medium-temperature tar. The great number of tars that were produced just now by low-temperature processes were not truly the lowest temperature tars; they were what might be called semi-low temperature tars. The only true low-temperature tar that he knew of was that carried forward immediately out of the temperature at which it was distilled. In most low-temperature processes where external heating was employed the gases reached 500° or 600°, and decomposition rapidly set in. This decomposition set in with a true low temperature; and when they were dealing with a low-temperature tar, and distilled it, a very large amount of dissociation took place under these conditions. This was the necessity he saw for a further definition of high and low temperature tars. The next point in the paper he would like to speak about was where the author drew attention to the possibility of the vertical retort tar being paraffinoid in nature, similar to low-temperature tar, and that vertical retort tar might be looked upon as a mixture of high and low temperature tar. In the true low-temperature tar made by the Maclaurin process he did not find this to be the case; and he was inclined to think it was not so. He would like to draw attention to an interesting point in connection with the percentage of tar acids in horizontal and vertical retorts, as between high-temperature and low-temperature distillation. There was 9 p.ct. of crude tar acids from a high-temperature tar, and, roughly, this worked out at about 9 lbs. per ton of coal. Ordinary vertical retort tar gave about 20 lbs. of tar acids per ton of coal; and with a true low-temperature tar the figure was about 40 lbs. If they followed the figures dealing with blast-furnace tar, there was a greater percentage of higher boiling-point phenols. This was a characteristic of low-temperature tars; and figures in the paper indicated a rapid decline in the high boiling-point phenols in vertical retort tars. The percentage of high boiling-point phenols with low-temperature tars was from 30 to 40 at temperatures from 250° to 300°; and there were still phenolic bodies in the pitch when they went to 320°. The point he wished to make was that these high boiling-point phenols were being decomposed in the ordinary process of distillation, and gave the benzene; and was it possible that the naphthalene occurred in high-temperature distillation just as the high boiling-point phenols were distilled, and of which at present we did not know the composition? He thought it worth while considering this, because naphthalene appeared just as the high boiling-point phenols disappeared; but it did not follow, because there were other aromatic bodies in the tar. Nevertheless, it was a suggestion that might be worth following up.

Mr. P. PARRISH said there were three essentially chemical engineering points which he wished to raise. He had had many years' experience of tar distillation, and had adopted several varieties of still settings; and it seemed to him that the setting which the author had adopted in his newer type of still only gave a short time contact as between the products of combustion and the still, by reason of the fact that he adopted a vertical flue. He knew that one of the considerations in connection with this arrangement was the fact that the still could be lifted out, and there was no necessity to replace the brickwork; but it seemed to him that this advantage could be attained, and yet a design of flue adopted which would admit of ten times the

contact obtained with the ordinary ones. He himself found that, from the point of view of efficiency, the spiral type of flue was infinitely better. With regard to the Dorr agitator, it seemed to him that there was an optimum agitation with that apparatus, but when they went beyond this, emulsions were formed; and he wondered whether the author had had any experience in this connection. With regard to the Kubierschky column, the bubbling type of column, and Lessing rings, it was highly important that chemical engineers should arrive at some co-efficient in regard to these various fractionating columns. This was work that should have been done long ago. The author had an admirable opportunity of trying their respective merits and deciding which was best. He had had many discussions with Dr. Lessing on this subject; and he still believed in bubbling. He had had a great deal of experience in connection with bubbling as compared with time contact, and had yet to be convinced that the enormous areas which had to be afforded in connection with time contact in order to obtain fractional condensation were at all comparable with the small column and high efficiency resulting from bubbling. However, he wished to suggest that the author had an admirable opportunity for determining, once for all, what the respective co-efficients were; and the chemical industry generally would be grateful to him if he would publish the data when he got it.

Mr. F. M. Potter said perhaps the best contribution he could make to the discussion would be to give some figures for the working of the Wilton coils, of which there had been some considerable experience. He was very much in love with the use of the Wilton coil with the pot still. He had erected units which dealt with 30,000 gallons in the 24 hours. These large units were not built as a vertical coil, but as a horizontal coil in two layers; the top layer being, as it were, a pre-heating section. With a coil of this kind, he was able to get a fuel figure of 240 lbs. of comparatively low-grade breeze coke—which would run out at about 10,000 B.Th.U.—per 1000 gallons. The fuel used on the pot still was about 240 lbs. This tar contained between 8 and 10 p.ct. of water; and these figures could be compared with those given by the author. His doubts as to the double-coil system were partly on the question of repairs and maintenance of the second coil; but he believed that in the early days some similar arrangement was tried, and found successful. The repairs were easily effected; but the life between renewals then got shorter, until it was best to remove the bottom layer altogether and start afresh. The 30,000 gallon coil kept four stills going and employed two men per shift—one working the coil, and one working the stills—so that they had two men per shift per 30,000 gallons of tar in 24 hours. This meant that the still was running about three charges in the 24 hours on the 12½-ton still, which gave somewhat swift working. The result was a comparatively high figure for pot stills. The average for the past twelve months was just over 100 charges per still. These figures might be of interest to those considering the use of the double Wilton coil. He had sometimes suspected that there might be some cracking in the Wilton coil, as compared with the pot still, on his small experimental units, and had endeavoured to trace it by way of putting the free carbon in the tar feed against the free carbon finally present; but he had found that the formation of free carbon was, in fact, exceedingly small. He had no figures from other works; but there were some American patents in which they claimed to effect great improvements in tar distillation by conducting it in an atmosphere of CO_2. They actually bubbled CO_2 and nitrogen gas through the still; and in the preamble to the patents some very large increases were claimed in the free carbon content during distillation.

Mr. Charles Cooper expressed the hope that the author would be able to give more information as to the working of the Wilton coils.

The Chairman said it seemed that the inventor of the pre-heater system had been somewhat forgotten in the paper. He believed the first patent taken out for this type of still, or pre-heaters as they were called, was in the last century, by Mr. Ellison; and he deserved the credit for it, though it was not followed up for a long time. Some years ago he (the speaker) went into the question of pre-heater stills, and had some large-scale experiments carried out, to ascertain how much heat was available. Four experiments were made at intervals. The first two were in the same week; and then there was an interval of a month before the next, and another interval of a month before the fourth experiment. Thus the weather conditions came in. They measured the water into the condenser, and measured the rise of temperature and the radiation losses; and the whole thing panned out that from the distillation of a ton of tar there were about 350,000 B.Th.U. available for pre-heating. He mentioned this to emphasize the extreme importance of the use of this type of still. Another point was whether they had considered sufficiently the loss of heat which went up the chimney in distilling tar. In experiments he had found to his horror that 60 p.ct. of the available carbon in the fuel went up the chimney, and only 40 p.ct. was utilized in distilling the tar. If the experiments of the author were successful, there would be a big saving in this connection.

Mr. Walmsley said he did not know that he could answer Mr. Maclaurin, who knew so much more about low-temperature carbonization than he himself did. As to Mr. Parrish's remarks on the spiral arrangement of flues, he had had one experience of this, and it was enough. While there might not be the same heat efficiency in the other system, they must take into account the length of life and the wear and tear on the stills, because at the present time stills were expensive. He could not answer the question with regard to emulsification in the Dorr agitator, because he had had no experience of it. He did not think there would be emulsification with the typhoon agitator. He had not used this type for washing the oils; but he had had oil washers, and there had not been any trouble through emulsification. There might be a little trouble where they had a variety of oils, and they did not get good settling; but if this was avoided, and they had a separate tank to hold 100 or 200 gallons, and ran off the part that had emulsified and only used the clear liquid, there was no trouble. If he obtained the results Mr. Parrish asked for as to fractionating columns, he would be very pleased to publish them. As to maintenance of the second Wilton coil mentioned by Mr. Potter, he had dismantled the top portion of the second coil used in the experiment mentioned in the paper, and found from ½ to ⅝ in. of carbon on the top lap, about ¼ in. on the next three, and about ⅛ in. on the following laps. The process would be no use until this was overcome. When he examined the pitch under the microscope, he found no more evidence of free carbon than before. He had not, however, had time to follow the experiment on these lines. It had been hoped that during the experiment some of the complex phenol bodies might be condensed out and give something in the nature of resins; but this had not happened, and the tar acids were the same as before. However, he meant to give these tar acids a chance, because one never knew what might happen. Therefore it was proposed to take the tar acids and put them through the coil, and get them separated first, to see if by any possible means these bodies could be broken down in any way, or be caused to condense out and give something of a residual nature. As regarded the smaller Wilton coils which he had, compared with those mentioned by Mr. Potter he gained a saving of three men for the day. He was very pleased to have the figures given by the Chairman as to the heat available for pre-heating purposes from the vapours issuing from the tar-still.

THE THOMAS GAS-METER AND RECORDING CALORIMETER.

We are advised by the Cambridge and Paul Instrument Company, Ltd., whose head offices and showrooms are at No. 45, Grosvenor Place, London, S.W., that they have entered into an agreement with the Cutler-Hammer Manufacturing Company, of America, to manufacture and sell in the British Empire the Thomas gas-meter and the Thomas recording calorimeter. A full illustrated description of the meter will be found in the "Journal," Vol. CLI., p. 76; and of the recording calorimeter in the "Journal," Vol. CLII., p. 387, and Vol. CLIV., p. 80.

A description of the meter as used for measuring gas in town-gas plants, with an illustration of one of a capacity of 150,000 c.ft. per hour installed in connection with the water-gas plant at the Shoreditch works of the Gas Light and Coke Company, has also been prepared by the Cambridge and Paul Instrument Company, who point out that the great feature of the meter is that measurements are recorded directly in standard cubic feet of gas or air, and need not be corrected for variations in pressure, temperature, humidity, gravity, or composition of the gas. Further, they say, the meters are accurate, reliable, and require little attention, and for some years have been well known in the United States, where the many instruments installed are giving complete satisfaction.

As a matter of fact, there are now nine Thomas meters fitted on gas plants in the United Kingdom; and extracts from letters received by the Cambridge and Paul Company regarding them show that they are being found as satisfactory on this side as has been the case in America. One user on unpurified coke-oven gas at high pressure has no fault whatever to find with the meter; and the same applies to carburetted water gas and other descriptions of gas.

As to the Thomas recording gas calorimeter, this is claimed to be a great advance. Owing, say the Cambridge and Paul Instrument Company, to the fact that air, and not water, is used as the medium which is heated, no errors are introduced by variation in the temperature of the gas or changes in the barometric pressure.

South Metropolitan Gas Company's Dividend.—The South Metropolitan Gas Company announce an interim dividend of 5 p.ct. per annum, less tax, on the ordinary stock.

Action of Light upon the Human Body.—A Committee has been appointed by the Medical Research Council to advise them upon the promotion of researches into the biological actions of light, with a view to obtaining better knowledge of the effect of sunlight and other forms of light upon the body in health and disease. The Chairman is Prof. Sir W. M. Bayliss, F.R.S. (a member of the Council of the Illuminating Engineering Society), and Dr. Leonard Hill, F.R.S., is also a member of the Committee.

The Gas Light and Coke Company's Dividend.—The Directors of the Gas Light and Coke Company have declared dividends for the half year ended June 30 last at the rate of 4 p.ct. per annum on the 4 p.ct. consolidated preference stock, 3½ p.ct. per annum on the 3½ p.ct. maximum stock, and £5 4s. p.ct. per annum on the ordinary stock. Referring to the matter in their City Notes on Monday, "The Times" said: Shareholders of the Gas Light and Coke Company will be pleased to observe that the dividend announced for the past half year is at the rate of £5 4s. p.ct. per annum, against £4 13s. 4d. p.ct. for the preceding two half years. This is the maximum dividend payable under the sliding-scale with the price of gas at 1s. 1d. per therm. The announcement of this increased dividend is accompanied by the further announcement, which will be specially welcome to the consumer, that the price of gas will be reduced by 2d. per therm—namely, from 1s. 1d. to 11d. On the present sliding-scale, this reduction in the price of gas will permit of the payment of a maximum dividend of £6 10s. 8d. p.ct. per annum on the ordinary stock. But it does not necessarily follow that the next dividend will be at this rate; the amount must depend upon the future net earnings of the Company. It must also be borne in mind that the present sliding-scale is subject to revision. Stockholders in gas companies generally did not profit from war conditions, for their dividends were reduced; and, should any attempt be made to revise the present sliding-scale, no doubt it would be possible for the companies to put forward an excellent case. But the contingency of its possible revision should not be overlooked.

THE STANDARDIZATION OF GAS-COOKERS.

SPECIFICATION OF THE STANDARDIZATION COMMITTEE OF THE NATIONAL GAS COUNCIL.

[Approved and Adopted by the Central Executive Board, May 9, 1922.]

(The Committee's Report will be found in the "JOURNAL" for July 5 and July 12.)

(Concluded from p. 160.)

GRILL BURNERS.

The grill burners to be of the special tubular revolving type, as per pattern, and in two sizes only, for the whole series of cookers, as follows:

Right and left burners for Nos. 1, 2, and 3 cookers = 8 in. long.
Right and left burners for Nos. 4 and 5 cookers = 9 in. long.

Teats to be cast at 7/16 in. to ½ in. pitch along the inner side of each burner, the teats being neatly and horizontally drilled with ⅛ in. holes; and equal length of flames must be ensured from end to end of the tube.

A boss to be provided for the accommodation of the mixture-adjusting screw in a position easy of access for regulation.

An operating wing or lug to be cast at the front end of each burner, to permit of each burner tube being revolved into two definite positions—*i.e.*, upwards for boiling, without smothering of flame, and horizontally for grilling purposes.

The burner must, in both positions, be incapable of shifting up or down by vibration.

GRILL FRETS.

The grill frets to be (to pattern) of the cast double "fixed" type. They must be capable of lifting-out (without screws), for cleaning or replacement.

The frets to be supplied in two sizes only—*i.e.*:

Nos. 1, 2, and 3 sizes of cookers — 2¼ in. wide by 8½ in. long.
„ 4 and 5 „ „ — 2½ in. „ by 9½ in. „

Proper space to be left between the inner edges of the two frets, and also between the outer edges of the frets and the burners. Both frets to be set over the flames, so as to ensure their thoroughly heating the whole of the surface without interfering with the proper combustion.

TAP RAIL.

The tap rail to be constructed of stout cast iron, and neatly housed under the front cornice.

The casting must be thick enough to permit of drilling and tapping to the depth of at least five full standard ¼ in. gas threads (½ in. brass) for each gas tap; the drillings being so placed as to ensure that only one-half of the oval tap fans shall project beyond the edge of the cornice bevel, and that the taps can be exchanged without removing the tap rail complete.

At the right-hand end of the tap rail a standard gas-barrel nipple is to be inserted, and the float thickened-out to permit of five definite threads being tapped for the insertion of nipples, as follows:

Nos. 1 and 2 tap rails — ½ in. nipple.
„ 3, 4, and 5 — ¾ in. „

The other end of the tap rail to be properly drilled, tapped, and plugged with standard gas plugs, as per above sizes.

HOT-PLATE TAPS AND INJECTORS.

The taps for all hot-plate burners to be of one standard pattern and size, with full bore to tap plug, and constructed of not less than 60/40 brass, to pattern; the thread being ¼ in. (iron) external gas thread, of not less than five full threads in length. The plug to be fitted at end with washer and nut, with sufficient thread to permit of regrinding-in when required. The washer to engage a stout stop to be cast on the tap body, to obviate drilling and tapping for knighting pins.

All the injector nozzles to be carefully drilled with a 5-32 in. orifice, and the inner facing of the orifice to be coned, and to be in alignment with the drilling and tapping at the front of the tap where the gas-adjusting pin is inserted. The tap to be drilled centrally on the handle side, and tapped-out to take the adjusting pin. This pin to be carefully turned and evenly coned to a sharp point, to be fitted with guides, and to be capable of passing through the gas orifice, so as to close same completely if required.

The taper of the pin to be at least ½ in. in length.

The screwed end of the pins to be interchangeable with all taps, and fitted with a stout locknut, milled on edge. The head of the pin to be stoutly turned and deeply cross cut, permitting of the use of a screwdriver.

The shank or stem of the tap handle to be of sufficient length to clear easily the adjusting pin, when the handle is in the "off" position; and the handle to be of the oval fan type.

GRILL TINS AND GRIDS.

The grill tin to be made in two sizes only, and of the round-cornered type, pressed out of not less than No. 24 gauge (before tinning) sheet steel with turned edges, and fitted with two drop, riveted loop handles, one handle on one side, and the other on one end of the tin (permitting of their being used with existing cookers with grillers in two positions).

The No. 1 tin to be 11 in. long and 8¾ in. wide, and the No. 2 tin to be 12¼ in. long by 9½ in. wide. The whole to be thoroughly coated with pure tin.

The grids to be in two sizes only—*i.e.*:

No. 1 = 8½ in. long by 6 in. wide; and No. 2 = 9 in. long by 6½ in. wide.

Legs of similar metal to be formed at the ends, to give two heights—*e.g.*, a maximum distance of 2¾ in. on one side, and a minimum distance of 1¾ in. on the other; these distances to be taken from the under face of the grill frets when actually in position in the hot-plate.

The heights to the centre of the grid bar, therefore, to be 1¼ in. on one leg and 2¼ in. on the other. The whole grid to be thoroughly coated with pure tin.

OVEN SUPPLY PIPE AND TAP.

The gas supply pipes for the oven to be applied as follows:

Nos. 1, 2, and 3 sizes of cookers, ¼ in. in wrought-iron standard gas tubing, carrying the oven tap, and connected by running a ¼ in. iron connector socket over the tap thread. The bottom end of the oven supply pipe to be screwed into a ¼ in. standard wrought-iron gas elbow.

The oven tap to be made in two sizes only—*i.e.*:

No. 1 for Nos. 1, 2, and 3 cookers = ¼ in. iron (M. and F.).
„ 2 „ 4 and 5 „ = ⅜ in. „ „

and constructed of stout 60/40 brass with a strong, full bored plug; the plug having a screwed tail with nut and washer complete. The washer to engage a strong stop, cast on the body of the tap, instead of the usual knighting pin. The tail of the plug to terminate in square cross section to form a plug end to engage the loose damper rod to the flue outlet. (See damper rod.)

The words "OVEN GAS" to be cast in the upper surface of the tap fan, which fan is to be of the oval type, of not less than 2 in. in width.

ENAMELLED CROWN PLATE.

A loose crown plate to be constructed for each size of hot-plate, of steel, of not less than No. 18 gauge, white enamelled, with drip roll in front, and the edges of back and sides turned up not less than ⅜ in. all round. The plate to fit neatly and easily in between the two hot-plate bridges.

OVENS.

The ovens to be constructed in accordance with plans—see dimensions [given last week]; and when assembling, the top, side, and back joints to be well sealed with a reliable mastic cement.

All castings to be capable of being easily assembled and dissembled.

The flue outlets of all cookers to be toward the back of the right hand side casting (see flue outlets).

The side and back castings to be carried as close as possible to the floor line; but sufficient space to be left to permit of cleaning around the inside of the base. Horizontal ribs to be formed on the insides of the back and side and door castings, to keep the packing in position.

FRONT FRAMES.

The front frames to be kept as low as possible at the bottom part, to facilitate the cleaning of the inside of the oven base, compatible with the retention of sufficient strength in that portion of the casting coming between the bottom of the oven door and floor line, and allowing for 1¾ in. clearing space from the floor line upwards, and of the proper widths to permit of the easy insertion of the drip tin, also allowing sufficient cover for the oven supply injector tube.

Two stout door lugs to be cast on the left-hand side of the front frames, with wrought pins inserted for hanging doors (opening from right when facing cooker).

DOOR CATCH.

A catch to be cast to the right-hand side of the front frame to engage the latch.

DOOR LATCH AND KNOB.

The latch to be of the banjo pattern (as per drawing).* The knob to be of hardwood to pattern.

ENAMEL OR ALUMINIUM OVEN LININGS.

In the packed cookers the linings to be of No. 18 gauge sheet steel, well enamelled with a hard grey mottled enamel, and affixed so as to prevent the use of screws on the faces.

The linings to be shaped as per drawings, and capable of being reversed; the bottom of the side and back linings fitting into a slot formed over the burner shields.

Where desired, the best rolled aluminium sheet of No. 15 gauge is to be used, and of not less than 98 p.ct. purity.

* The drawings referred to in this portion of the specification were reproduced in last week's "JOURNAL."—ED. "G. J."

INNER CROWN.

A products baffle chamber of not less than 1 in. in height to be formed under the cast top crown, by the insertion of a loose inner sheet crown, which is to be supported at the sides and back on the separate castings shown in the drawings.

The inner crown sheet to be constructed of a No. 18 gauge steel plate, enamelled on both sides, or of No. 15 gauge best rolled aluminium sheet, where required. The plate to permit of free egress of the products, and to be secured in position to the crown plate.

OVEN GATE RACKS.

The gate racks to be wrought steel of No. 20 gauge, to pattern. The runners to be set at a pitch of 1½ in. between each.

They must be interchangeable and reversible, and reduced in number to as few sizes as possible. The top runner, however, must come just under the inner crown, to enable a grid to be inserted so that a meat-hook can be used when required, by hanging it to the grid.

The gate racks must be fitted with a safe catch or locking device, to prevent the grid falling when being drawn forward.

OVEN GRID SHELVES.

These to be constructed with a substantial catch to engage with the runners on gate racks, and slightly rounded at the two back corners. The bars to be at a pitch of 1¾ in.

OVEN BURNERS.

The oven burners to be of the loose horizontal "centrally fed" type, with the mixing tube restricted or venturied towards the mouth. The gas nipples to be properly centred in the burner tubes.

The air (or mixture) adjusting screw to be applied in an accessible position, enabling adjustment to be made with the burner in position.

The details of this adjusting screw to be as for hot-plate burners.

Teats to be cast equi-distant along the tube at a pitch of $\frac{7}{16}$ in. to ½ in., and drilled with ⅛-in. flame orifices.

OVEN INJECTOR TUBE.

This tube to be of cast iron, and drilled and tapped for the screwing-in of the gas injector on one side, and for the injector pin on the other.

The locknut and pin to be capable of easy adjustment through the hole formed in the bottom of the front frame casting on each side.

BROWNING SHEET.

This to be of No. 18 gauge sheet steel with the two back corners clipped, and the front edge properly rolled to form a ⅜ in. bead.

OVEN DRIP TIN.

This to be of No. 24 gauge (before tinning) sheet steel, with slightly rounded corners and turned edges, and to slide neatly and easily through the front frame casting.

OVEN DOOR.

The door to be clean cast (to drawing), with the approved badge cast in the centre of the upper part of the door. Hinges to be cast on the left side (when facing cooker). Horizontal ribs to be cast on the back of the door (see ovens).

The door to fit tightly, to prevent loss of heat. The enamelled linings to be secured in position without projecting screwheads.

ASSEMBLING AND PACKING OVENS WITH SLAGWOOL.

The process for assembling and packing the oven sides and back may be as follows:

1.—Fix enamelled linings and the cast oven sides to the front frame.
2.—Fix the top and bottom enamelled lining supports (which also form the burner shield and inner crown support) in position.
3.—Lay the oven on the frame face and fill in the spaces between the ribs, &c., in both sides with slagwool.
4.—Screw the enamelled back lining to the side linings by screws through the returned edges of the linings.
5.—Fill in the spaces between the ribs of the back casting, and place back into position complete.

AREAS OF THE OUTLETS.

The areas of the elongated openings to be formed in the top back of the right-hand oven (side) castings to be based approximately on 1 sq. in. of opening to each cubic foot of oven capacity.

CAST FLUE OUTLETS.

These openings to be covered by a separate casting (to pattern), to receive the damper rod and wing, and also to serve as a spigot for the flue piping (when required), and so shaped as to prevent the flue outlet being closed when cloths, &c., are hung over them. This cast outlet to be screwed to the oven casting from the outside.

DAMPER AND ROD.

With the exception of No. 1 cooker, all cast outlets to receive the damper rod and wing. The rod to engage the square tail on the end of the oven tap plug (see oven tap); the damper wing being a separate D-cored casting, and secured to the rod by means of a small set-screw to permit of adjustment. The wing to be of cast iron, circular in form, with a segment removed from the circle to prevent the complete closing of the outlet.

The damper rod and wing to turn freely on their axis, without the slightest binding on the oven tap plug.

TESTING FOR VENTILATION.

After every oven is assembled, the following procedure must be adopted:

1.—The oven must be properly sealed at all joints.
2.—Vessels containing water must be placed in the oven to occupy approximately two-thirds of its capacity.
3.—The damper must be opened to the fullest extent.
4.—The tap must be turned on full.
5.—The oven must be tested at not less than 5 in. (water-gauge) pressure, with both burners alight.
6.—The burners must be left alight for 30 minutes.
7.—The flames must be carefully observed throughout this period (by means of a mirror placed below); and when they all appear well aerated and perfectly stable at every jet, the damper wing must be adjusted and set-screwed into position. This must then automatically reduce the outlet area with the operating of the oven tap, so as to be in the closed position for the minimum cooking consumption.

When the gas is turned off, the damper will therefore be very slightly opened.

R. J. ROGERS (*Chairman*).	F. W. GOODENOUGH.
GEO. HODSON.	ARTHUR H. BARKER.
JNO. LEWIS.	J. G. CLARK.
F. S. LARKIN.	E. C. HOLT (*Secretary*).

March 31, 1922.

MANCHESTER AND DISTRICT JUNIOR GAS ASSOCIATION.

Visit to the Derbyshire Silica Firebrick Company's Friden Works.

About fifty members of the Association last Wednesday visited the works of the Derbyshire Silica Firebrick Company at Friden, near Buxton. They assembled at the Washmere Pit, viewed the "getting" of the raw siliceous material, and inspected the several grades as sorted-out from the pits. Messrs. Frank West (Manager Director), Samuel Glover (Director), J. W. Fagan (General Manager), and M. Wagstaff and F. Brindley (Assistants) acted as guides on the tour round the works.

The firm are working four pits, and there are also other large unworked deposits on the estate. The materials in these pits are of the usual character, white and grey argillaceous sands make-up the bulk of the deposit in each. The Friden Pit is the largest—about 90 ft. deep and 100 yards square. The following variety of the materials are recognizable in the pit: Grey sand, "ganister," white sand (argillaceous), grey clay, white clay, and "soapy" white clay. In the Washmere Pit, which is shallower, from 20 ft. to 50 ft. of grey argillaceous sand is exposed. There is also a little white clay, and some sand almost free from clay. The contents of the Blakemore and Kenslow Pits are more irregular in character. Pebbles, which are not abundant at the other two pits, are here very numerous; while large deposits of black clay at the latter pit and some greenish clay occur. In none of these pits has the deposit been bottomed, and in the case of Washmere the evidence of old lead mines points to a large extension in the immediate neighbourhood.

The party saw five samples of material ready for passing into the grinding sheds, the contents being:

No. 1	69 p.ct.	silica and	21 p.ct.	alumina.	
No. 2	90 ,,	,,	6½ ,,	,,	
No. 3	93 ,,	,,	5 ,,	,,	
No. 4	95 ,,	,,	2½ ,,	,,	
No. 5	91½ ,,	,,	7 ,,	,,	

The raw material from the four pits is carefully sorted at the pits and the works into several different grades, each being stored separately. Part of the raw material is dried before grinding and mixing. When prepared, the ground mixture is fed by a bucket elevator on to a belt conveyor, which runs over a series of large bins, into which it drops its load as required. The material is soaked with water while on the conveyor. The wet mass then remains in the bins for a definite period, this process facilitating subsequent manipulations. Afterwards the material is conveyed to the pugs, where it is passed through large rollers, thoroughly pugged and shaped into clots, and pressed into the various shapes and sizes by means of powerful presses. The finished shapes are then carefully dried by various methods and burnt in the kilns to a temperature of 1410° to 1425° C.; Seger cones 14-15 being placed in the centre of the kilns to give the average temperature of the burning.

The goods are burnt-off at a temperature greater than they will have to withstand in practical working. The material is practically non-expanding, being less than ¼ p.ct. when heated to the maximum combustion-chamber temperature. The squatting temperature of these siliceous goods under load is much higher than that of most other refractory materials. The silica content, ascertained from tests made regularly by Dr. J. W.

Mellor, has been practically constant for many years, never varying more than ¾ p.ct. Friden refractories are used by retort builders, coke-oven contractors, gas-works, and in the Glover-West vertical retorts in this country and abroad.

The workshops are very extensive and well-lighted. The grinding pan has a capacity of 9 tons per hour. Most of the water for the works is drawn from an artesian well at the rate of 1000 gallons per hour. There are several presses. One does 1150 squares (9 in. by 4½ in. by 3 in.) per hour, another 3000, and a third 4000 daily average.

The design and a rough specimen of the works memorial tablet was seen; and it was stated that the permanent one was to be unveiled by the Duke of Devonshire. The whole of the labour has been given by the employees themselves.

At the conclusion of the tour round the works, the visitors partook of tea in a specially erected marquee in the grounds adjoining the offices. Mr. Frank West, in welcoming the members, said that the works were established by the late Mr. John West in 1892, for making materials to withstand the high temperatures that were required. They had 200 employees, and finished fourteen truck loads of goods per day. All these we subjected to rigid inspection, and came well within the standard specification. Their material was made to stand a big load, at a high temperature, which was an important feature in the building of arches, &c. Mr. J. Bridge moved, and Mr. W. Buckley seconded, a vote of thanks to the firm for their hospitality. This was supported by the President (Mr. G. Dixon, B.Eng.), and replied to by Mr. West, Mr. Glover, and Mr. Fagan.

DISPOSAL OF SPENT LIQUOR.

We are indebted to Dr. T. Lewis Bailey, Chief Inspector under the Alkali Works Regulation Act, for the following memorandum on the "Disposal of Spent Liquor," which had, for Departmental reasons, to be excluded from his Annual Report for 1921, the portion of which dealing with this matter was reproduced in last week's "JOURNAL" [p. 150]. The memorandum contains historical matter of interest to those who are studying the question of the disposal of spent liquor effluents from ammonia stills.

1.—ADMISSION TO THE SEWERS UNDER STRICTLY-GOVERNED CONDITIONS.

(*a*) Volume of effluent liquor not to exceed (say) 1 to 2 p.ct. of the total volume of sewage.

(*b*) Devil liquor, if withdrawn cold from the condensers, to be (*i*) returned to the still with the feed liquor, (*ii*) separately filtered through a bed of oxide of iron before admixture with the general body of effluent liquor, or (*iii*) returned to the liquor well or gas-scrubbing system.

If withdrawn hot, to be taken from the *hottest* point of the condensing system, and at such a temperature as to leave in solution traces only of sulphuretted hydrogen and hydrocyanic acid.

(*c*) Effluent to be properly settled, or freed from suspended bodies by filtration.

(*d*) Effluent to be cooled—temperature not to exceed (say) 90° Fahr. (32° C.).

(See Annual Reports, 1898, pp. 24, 122.)

2.—UTILIZATION ON THE WORKS.

(*a*) For coke quenching, after settlement and large dilution.

This method is in successful operation at several coke ovens and gas-works. Objection has been raised, in certain cases, to its effect on the appearance of the coke, and in gas-works generally to the corrosive effect of the liquor on ironwork when coke is quenched at the furnace front.

(*b*) Evaporation on producer hearth or under boiler fires, or in special pans or furnaces.

This method is economically sound only in cases where abundance of waste heat is available, such as occurs in the Lanarkshire iron-works and in some coke-oven works.

(*c*) Return of a portion of the cold, settled liquor to the ammonia scrubbers in place of water.

(*d*) Use for steam raising in boilers, after dilution with uncontaminated water.

Objection is raised that the tar and other impurities become concentrated on boiling, and that boilers require to be blown-off more frequently, with loss of heat. Also that the steam becomes highly charged with volatile impurities that may corrode brass fittings and packings.

(See Dr. H. Maclean Wilson. Paper read before the Midland Institute of Mining, Civil, and Mechanical Engineers on "The Pollution of Streams by Spent Gas Liquor from Coke-Ovens and the Methods Adopted for its Prevention"—General Meeting at Sheffield, Feb. 15, 1910.)

(*e*) Use, in place of water, on the wash-tower of combustion-neutralization plant. (Annual Report, 1901, p. 134.)

(*f*) Neutralization and decolorization effected by mixing with the effluent bisulphite liquors from combustion-neutralization plants. (*Ibid.* 1902, p. 164.)

(*g*) Use, in limited quantity, in lime mixing tank of the sulphate of ammonia plant in place of cold water.

This has the advantage of conserving waste heat and of providing the still man with a ready test for ensuring an adequate lime feed at the still; deficiency of lime in the still is followed by evolution of ammonia when the spent liquor meets with fresh lime in the mixing tank.

(*h*) Discharge of the effluent on to waste spoil heaps and colliery tips of large size—if possible, on to waste tips on fire.

The effluent liquor that finally escapes as drainage at the base of the heaps is said to contain cyanide and sulphate produced by selective oxidation of the thiocyanate.

$$CNS + 3O = CN + SO_3$$

(*i*) Discharge into old colliery workings and quarries, where it mixes with a large volume of underground water.

There is risk here, when dilution is inadequate, of the undue pollution of the underground water repumped for general use on the colliery, or of water courses into which such water may find its way by underground channels.

(*j*) Use for coal washing.

Trouble from undue frothing has been met with at certain works.

3.—CHEMICAL TREATMENT.

(*a*) Diamond's process. Details are lacking (*Ibid.* 1899, p. 121).

(*b*) Radcliffe's process, 1925. (Annual Reports, 1906, p. 143.)

Combustion of the whole, or a proportion, of the saturator gases in a special furnace and arrest of the sulphur dioxide in a small limestone tower. The bisulphite solution thus obtained is used in conjunction with copper sulphate to decolorize the alkaline phenates and precipitate the thiocyanate as cuprous salt.

The process is obsolete. Much of the copper salt is necessarily used up by interaction with thiosulphate; the first cost is prohibitive, therefore, and the cuprous thiocyanate obtained has no commercial value.

Radcliffe's modified process, 1910. Special and complicated plant is needed, comprising iron scrubbing tower, pumps, condenser, settling pits, and filter beds. The patentee claims that all solids in suspension, all free lime, all hydrocyanic acid, 70 p.ct. of the thiocyanate, and 60 p.ct. of the solids in solution can thus be removed, and that the oxygen-absorbed figure can be reduced by 75 p.ct. The patentee's claims are unsupported by experimental data, and the purification effected in practice has proved to be far below expectation. The process is obsolete.

(*c*) Neutralization in special scrubber by the residual gases from a Claus kiln worked on the acid side, followed by aeration of the liquor in a secondary scrubber to remove dissolved sulphuretted hydrogen and sulphurous acid.

Properly worked, this process should yield a decolorized effluent; but conditions *quâ* temperature are not favourable for the removal of phenoloid bodies, and sulphur compounds are formed which cause the oxygen absorptive properties of the effluent greatly to exceed that of the feed liquor.

4.—BACTERIAL TREATMENT ON FILTER BED.

Dr. Gilbert Fowler and his collaborators have shown (J. Soc. Chem. Ind., February, 1911) that spent liquor, suitably diluted, is amenable to treatment on biological filters. Two to three cubic yards of filtering material are required for each ten gallons of the crude liquor treated per twenty-four hours.

The treatment is successful in effecting a marked reduction in the oxygen-absorbed figure; but the cost of treatment is considerable, and the process has not proceeded beyond the experimental stage.

5.—SPECIAL PROCESSES.

(*a*) Davis's process, as experimentally worked by Mr. Belton at the Shrewsbury Gas-Works in 1894. (Reports, 1894, p. 69.)

The process involves the use of sodium carbonate in place of lime, the evaporation of a portion of the liquor, and the final recovery, after further evaporation and crystallization, of a mother liquor for sale containing 14·4 p.ct. of ammonium thiocyanate.

(*b*) Clarified liquor blown with chimney gases and steam.

This method of treatment appears to have been tried experimentally, and for a short period only, at one of the Lancashire chemical works in 1911. The process was intended to effect removal of lime salts, and had no relation to the volatilization of phenoloid bodies. A brief reference to the process was only discovered after completion of the experimental work described in the Annual Report for 1921.

(*c*) *Continental Practice.*—A method is noticed in the J.Soc.Chem. Ind. for Oct. 31, 1919, p. 790A., in which the liquor, after settling, is blown with flue gases and air. The treated effluent is filtered through brown coal in pieces of less than 1 cm. diam.

6.—SUMMARY OF RECOMMENDATIONS BY THE ROYAL COMMISSION ON SEWAGE DISPOSAL.

The question of the disposal of spent ammoniacal liquor received special attention at the hands of the Royal Commission on Sewage Disposal. Various methods of treatment were considered, and a summary of recommendations appended from which the following extract is made:

"SUMMARY AS REGARDS SPENT GAS LIQUOR."

"In view of the highly noxious character of waste gas liquor, we are of opinion that in no circumstances should it be allowed to be discharged untreated into a stream.

"When it is produced at gas-works in a town, and does not at any time exceed 2 p.ct. by volume of the sewage, it may, without serious detriment to the subsequent purification of the sewage, be allowed into the sewers, always provided that there is sufficient tank capacity at the gas-works where the gas liquor is produced

to ensure that it shall flow into the sewers equably, and, as far as possible, continuously and not in flushes. At certain sewage-works the biological efficiency of the tanks and filters has on occasion been seriously affected by an unexpected flush of this liquor. It must exert, of course, the same prejudicial effect upon the working of a sewage farm.

"When the spent gas liquor, before being discharged into the sewers, is subjected to partial purification, a larger relative volume may be mixed with the sewage. We are not aware of any method of partial purification which is fairly successful, other than that suggested by Dr. Fowler; and this, we think, would probably prove more expensive than combined treatment of the gas liquor with sewage, where sewage was available.

"As at most collieries there are large spoil heaps, we recommend that these should be used for the purification of the spent liquor by percolating filtration, as in the case of the 'bings' at the shale-oil works in Mid and West Lothian. This may not in all cases result in a satisfactory effluent; but considerable purification will always be effected where large spoil heaps exist.

"Where there are no spoil heaps, we can only suggest, as an alternative at the present moment, the evaporation of the liquor.

"With the exception of the filtration of the waste liquor from shale distilling works through 'bings' of spent shale, which must be regarded as a somewhat special case, we know of no method by which spent gas liquor can be purified at a reasonable cost to such an extent as to render it innocuous if discharged into a stream. There are consequently no data to show what degree of purification might reasonably be asked for. Further work on the subject is thus required in order to prevent or diminish the serious injury to streams which is at present taking place in certain places."

(Royal Commission on Sewage Disposal, 1915. Ninth Report, Vol. I., p. 164.)

Elevating Coke by Skip Hoist.

In the early part of last year, Mr. Charles B. Gamble, the Superintendent of the Minneapolis Gas Light Company, was anxious to secure a coke-handling plant to take coke from small electric cars, and elevate it to a storage bin alongside the water-gas generator house. The lift was approximately 100 ft., and had to be straight up. The small cars referred to hold about 3500 lbs. of coke; and some 250 tons have to be handled in eight hours. The problem was solved by the provision of an automatic skip hoist. The hoist is loaded from a hopper set flush with the ground level, into which the coke is first discharged. The skip consists of a 60 c.ft. bucket operating at a speed of 250 ft. per minute, and slowing down to half-speed at the upper and lower limits of travel. This machine is capable of elevating 30 tons of retort coke per hour. The entire operation of the machine is automatic. Coke is received at the ground hopper, and loaded into the skip bucket by a "Simplex" loader. The operator pushes a starting-button, and the skip bucket ascends, accelerates to 250 ft. per minute, slows-down, and discharges at the top, lowers and re-loads automatically, and again ascends. This cycle is repeated until the stop-button is pushed. The "Simplex" loader consists of a 2 ft. square shoot or body bolted to the outlet of the ground-hopper. This shoot has cast-iron sides, and a heavy steel-plate bottom. To it is suspended a pivoted, undercut shoot built with cast-steel sides and a heavy steel-plate top and bottom. This pivoted shoot is opened by the descending skip bucket coming in contact with, and pulling down, an operating bale attached to the shoot, and is closed when the skip bucket ascends. Counter weights are attached to the pivoted shoot, to assist in closing and to keep it closed. The opening hook is of a type which equalizes the pull on the shoot, and prevents undue shock to the bucket and loader at the instant of contact. Should the skip bucket by accident fall, the sudden impact causes the hook to swing back out of the path of the falling bucket, preventing any damage to the loader. The skip bucket comprises a simple rectangular steel box open at the top, and fitted with flanged wheels and hoist bale. It is discharged by inverting on dump rails. The electrically driven skip hoist is of the counter-weighted type; the total amount of counter-weight being such that the load on the hoist is approximately the same when lowering as when hoisting.

Gas for Drying Barrels.—In the works of a Chicago cooper who is doing business on a large scale, gas is used to dry barrels in process of manufacture. The heat is introduced from below, and passes both inside and outside of the assembled staves. For the purpose of confining the heat, drums are lowered over the barrels.

Interior Lighting of Shops.—Gas undertakings have a large field for business in connection with the interior lighting of shops, a matter which is dealt with in No. 101 of "A Thousand-and-One Uses for Gas," published by the British Commercial Gas Association. The latter part of the summer is rightly regarded by most business people as the best time to overhaul their lighting installations against the dark days and evenings of autumn and winter, and therefore the appearance of the issue referred to is specially opportune. It is, moreover, drawn-up on lines which will appeal to the busy man, inasmuch as it consists mainly of photographs of well-lighted shop interiors, with brief paragraphs pointing out the salient features of each installation. The booklet is designed to interest the large store-keeper as well as the smallest shop-keeper.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Life of Gas-Meters Committee Report.

SIR,—In reply to the letter of Mr. H. Kendrick [*ante*, p. 97], and in reference to the chalk process for extraction of hydrocyanic acid, it is difficult to decide on the proposed use of one section of a crude liquor tower-scrubber without having full information about the washing plant in any particular works. It is necessary that the chalk process should follow the extraction of tar and precede the extraction of the last portions of ammonia. Moreover, intermittent water spraying is found to be the best when using solid chalk. If it were possible and convenient to carry this out in one section of a crude-liquor scrubber, the ammonium thiocyanate need not be lost as a commercial product. This would depend on whether the hydrocyanic acid is to be recovered; the ammonia can certainly be extracted by the usual means. If there is any difficulty about the complete extraction of tar, a washer containing cream of chalk and water is the better.

Mr. Kendrick asks the reason why gummy deposits should be more prevalent in summer than in winter. To answer this it may be necessary to ascertain whether the causes specified in section C of the report are accentuated in summer at the particular works referred to. Perhaps Mr. Kendrick would care to compare notes with us direct on this subject.

The reference to "undue friction" in the working of meters (Report, section F, paragraph 6) would no doubt be intended to cover restricted gas-ways. We believe that these gas-ways are being enlarged in the new standard meters.

J. G. TAPLAY.
c/o Institution of Gas Engineers, B. R. PARKINSON.
No. 28, Grosvenor Gardens, S.W. 1, July 21, 1922.

Some Gas-Burners and a Moral.

SIR,—I have to thank those who have written me on the above subject. Since my letters in your issue of July 5, Mr. J. C. Walker, the Secretary of the British Commercial Gas Association, has written stating that a Joint Committee consisting of six representatives of the British Commercial Gas Association and six of the Lighting Section of the Society of British Gas Industries has been set-up for the purpose of considering what steps can be taken towards standardization of the essential parts of burners, the elimination of shoddy burners, mantles, and fittings from the market, and the maintenance and development of gas lighting. This obviates the need for further discussion of the subject. It now only remains to await the results of the Joint Committee in October next.

If, as stated, this Committee was formed some time ago, it is a pity no mention was made of it at the Institution meeting last month, on the reading and discussion of Dr. Carpenter's paper, when engineers from the four points of the compass had foregathered. Now, only after the members have dispersed, and publicity has been given to the matter in the Technical Press, is the announcement made of the setting-up of the Committee. If the Committee had been appointed previous to the reading of Dr. Carpenter's paper, there must have been many, had they known, who would have mentioned it during the discussion.

London, July 24, 1922. W. J. LIBERTY.

LEGAL INTELLIGENCE.

CARRYING-ON THE ELMSALL GAS-WORKS.

An application was made, on Thursday last, to Mr. Justice Astbury, in the Chancery Division of the High Court of Justice, for directions as to the carrying-on of a gas undertaking known as the South Elmsall, South Kinkley, and North Elmsall Gas Company.

The matter came before the Court on a summons taken out by Mrs. Mary Anne Porter, sole surviving executrix and trustee of the late Robert Porter, who had carried on the undertaking, till his death in 1921, with Mr. Samuel Bowes Beaumont, who died a week or two after Mr. Porter.

Mr. GURDON, Counsel for Mrs. Porter, said her husband and Mr. Beaumont purchased this gas undertaking and carried it on for eleven years, dividing the profits between them equally. Mrs. Porter and the administratrix of Mr. Beaumont's estate had carried on the concern in precisely the same way. It was valued at £30.000. The only offer received was substantially below this figure. The testator expressed a wish that his trustee should not dispose of any of his undertakings until after the expiration of five years, unless they thought they should. Mrs. Porter was anxious to know whether she should go on. The defendants to the summons were interested in the testator's will, and joined in seeking the direction of the Court.

HIS LORDSHIP said he did not see what else they could do than carry-on. He would direct that the executrix was entitled to continue the business in conjunction with the personal representative of Mr. Beaumont, with a view to realizing the same as a going concern, but not beyond two years without further order. As to the question of sale, His Lordship directed that application be made to the Court as to the mode of selling the business.

Huddersfield and the Therm System.—The Huddersfield Gas Committee last week discussed the question of the advisability or otherwise of changing the system of charging for gas from that of cubic feet to therms; but the idea was not received with favour. It was decided to await a report from a Sub-Committee of the National Gas Council.

REGISTER OF PATENTS.

Burners for Incandescent Lighting.—No. 181,748.

SUTTON, C. J., of Bolton.

No. 30,345; Aug. 22, 1921.

This invention relates to burners for use in incandescent gas lighting, particularly of the inverted type, and has special reference to the nipple for connecting the tube, forming part of or supporting the burner, with the gas supply pipe. The patentee claims—

In connection with burners for use in incandescent gas lighting, a nipple having a lateral air passage and an integral diaphragm having a small aperture therethrough, the nipple being formed with two internal threads or with one internal thread and a plain cup.

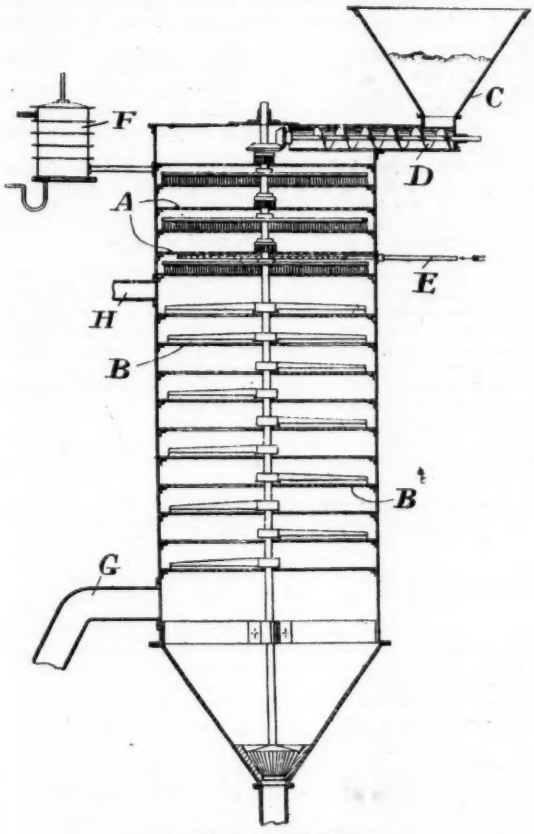
Manufacture of Dry Neutral Sulphate of Ammonia.—No. 181,884.

THE EBBW VALE STEEL, IRON, & COAL CO., LTD., of Ebbw Vale, and THICKINS, D., of Abertillery.

No. 10,482; April 9, 1921.

This invention relates to producing dry neutral sulphate of ammonia in a powdered condition, and consists in causing sulphate of ammonia of ordinary make (hereinafter referred to as salt) to pass in a finely divided state downward through a succession of sieves in the presence of an ascending neutralizing current of ammonia containing a percentage of steam and warm air, and thereafter over a series of shelves or grids in the presence of an ascending current of hot drying air; the waste gases from the stream of ammonia, as well (it may be) as those from the hot air, being conducted to a device or devices for the absorption of pyridine by any suitable reagent.

Apparatus suitable for carrying out the method outlined above can be variously constructed, and fig. 1 shows in sectional elevation one form of apparatus that may advantageously be used.



Thickins' Sulphate Plant.

A vertical cylindrical casing, which may be made of iron, is provided near the top with a number of horizontal sieves A, which may be of wire of appropriate mesh—one-eighth of an inch for instance, or of different meshes. Beneath the sieves A is a series of circular shelves or grids B, which are provided each with one or more radial slots—those in one half being arranged in staggered relationship to those in an adjacent shelf. Alternatively, the grids may be perforated uniformly over the entire surface, or over regions arranged in staggered relationship; or the perforated regions may be segmental instead of circular, the segmental gaps being in this case staggered.

A rotatable shaft extends vertically through the various sieves and shelves, and is provided with arms or other devices adapted to be rotated over all or some of the sieves and shelves in order to cause the descent of the salt. These arms may take the form of brushes or of scrapers. The salt may be introduced continuously from a suitable hopper C by means of a worm conveyor D, which may be geared to the shaft by bevel wheels.

One or more inlets E, with distributors, may be provided in the casing above or below the lowermost of the sieves A, to permit of the admission of ammonia vapour and steam and warm air; while an outlet near the top of the casing serves to conduct the waste gases to a catch-pot F of suitable type for the absorption of pyridine from the gases. A similar inlet G and an outlet H are likewise provided for admission of hot drying air to the casing below and above the shelves B respectively; the outlet H being, if desired, connected to the catch-pot F, or to a separate catch-pot or a scrubber.

The dried neutral salt finally drops from the lowest of the shelves C into the conical bottom of the casing, where (if desired) a conical grinding device may be arranged, secured to the vertical shaft, in order to ensure the salt's being reduced to a uniformly fine condition, in which state it may be delivered to a storage bin, or directly into bags.

Retorts.—No. 181,894.

LOW TEMPERATURE CARBONISATION, LTD., of Cockspur Street, S.W. and DAVIDSON, T. M., of Bromley.

No. 11,222; April 18, 1921.

This invention relates to retorts for use in the destructive distillation of coal and other carbonaceous substances, and is especially applicable for distillation at comparatively low temperatures. In the use of vertical retorts built up of sections or blocks of firebrick, it has been found difficult to maintain gas-tight joints. It is the object of the present invention to avoid this disadvantage by building up the retort of metal protected by an inner and an outer lining of firebrick blocks.

In the construction of vertical retorts of an oblong cross-section, the retort is of cast iron of an oblong cross-sectional shape, tapering outwardly towards the bottom or otherwise, and at intervals there are externally protruding horizontal ribs or flanges for the support of the firebrick blocks or sections and for stiffening the casting, and internally protruding vertical ribs or flanges which may be of dovetail or other suitable section. According to one modification, the metal part of the retort may be of two or more longitudinal symmetrical parts dividing the retort in a vertical plane passing through the major axis of the cross-section; the respective symmetrical parts having outwardly extending vertical flanges at their respective ends, adapted to come into contact and serve as a means of securing the parts together. Alternatively, the metal part of the retort may be provided as an integral unit; or it may be provided as a vertical series of complete sections adapted to fit one upon the other, or it may be built up from a number of sections or plates in any other manner. The essential claims of the patentees are:

1. In metal retorts, the provision of internal and external linings or layers of firebrick in blocks or sections.

2. In retorts as specified, means for securing a lining or layer of firebrick in the form of separate blocks, comprising vertical ribs.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for July 19.]

Nos. 18,812 to 19,519.

BARBER, E. A. & F. F.—"Cash-box for coin-freed apparatus." No. 19,247.
BATCHELOR, A. E.—"Production of artificial light." No. 19,505.
BRAYSHAW, E. R. & S. N.—"Gas-burner." No. 19,088.
BROWN, F. L.—"Taps, valves, or cocks." No. 18,826.
BROWN, M. N.—"Device for protecting taps, valves, &c., against unauthorized operation." No. 19,387.
BROWNE, H. M.—"Apparatus for use with gas-meters, &c." No. 19,036.
CALDERWOOD, J.—"Dipper seal for gas-containing ducts, &c." No. 19,292.
CASEY, E. G.—"Street standards advertising lamp." No. 19,398.
CESCINSKY, C. F.—"Gas-taps," No. 18,920.
CHAPMAN ENGINEERING COMPANY.—"Ash-ejecting apparatus for gas-producers." No. 19,050.
CHOWN, J. A.—"Carbonization and distillation of carbonaceous material." No. 18,925.
CLARKE, T.—"Apparatus for controlling gas supply." No. 19,300.
CROSBIE, S.—"Liquid-fuel or gaseous furnaces." No. 19,283.
DAVIDSON, T. M.—"Closures for retorts." No. 19,294.
FABRY, R. F. F.—"Coke manufacture." No. 19,346.
HARRIS, J.—"Gaseous fuel." No. 19,161.
HELPS, G.—"Gas cookers and burners." No. 18,974.
HOWARD, J. R.—See Calderwood, J. No. 19,292.
INSULATORS, LTD.—"Process for treatment of tar, pitch, &c." No. 19,257.
JONES, A. C.—"Vapour lamps, &c., for lighting, &c." No. 18,976.
MESSENGER & SONS.—See Jones, A. C. No. 18,976.
MOORES, DE LA H.—"Valves or taps." No. 19,173.
PATTISON, C. M.—"Apparatus for manufacturing and utilizing combustion products." No. 19,091.
PERCOX, J. H.—See Jones, A. C. No. 18,976.
PICKFORD, W. E.—"Gas-compressors." No. 19,362.
RADIATION, LTD.—See Brayshaw, E. R. & S. N. No. 19,088.
ROSE, J. R.—See Harris, J. No. 19,161.
ROSS, D.—See Calderwood, J. No. 19,292.
ROSSITER, L. J.—"Valves." No. 18,829.
SHAW, J. F.—"Gas-cooker, &c." No. 19,211.
SOUTH METROPOLITAN GAS COMPANY.—See Browne, H. M. No. 19,036.
STREDWICK, E. S. & W. S.—See Browne, H. M. No. 19,036.
SUNDERLAND, W.—See Brown, F. L. No. 18,826.
SUTTON, H. W.—"Method of diffusing light." No. 19,363.
WALKER, T. B.—"Gas-generators." No. 19,248.
WHITE, T. H.—See Walker, T. B. No. 19,248.
WILTON, T. O.—"Valves, taps, or cocks." No. 19,508.
WINFIELD, J.—See Insulators, Ltd." No. 19,257.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

Progress of Bills.

Ramsgate Corporation Bill: Returned from the Commons, agreed to, with amendments, which were considered and agreed to.

Windsor Gas Bill: Returned from the Commons, with the amendments agreed to.

HOUSE OF COMMONS.

Progress of Bills.

Chester Gas Bill: Reported, with amendments.

Doncaster Corporation Bill: As amended, considered; amendments made; read the third time, and passed, with amendments.

Ramsgate Corporation Bill: Read the third time, and passed, with amendments.

Windsor Gas Bill: Lords' amendment considered, and agreed to.

Royal Assent.

The following Bills received the Royal Assent last Thursday: Buckhaven and Leven Gas Commission Order Confirmation; Croydon Gas; Stretford and District Gas Board; Windsor Gas.

Gas Regulation Act, 1920.

Copies were presented of drafts of Special Orders proposed to be made by the Board of Trade under section 10 of the Act on the applications of the Elstree and Boreham Wood Gas Company, Ltd.; Kidsgrove Gas Light Company; Truro Gas Company; Atherton Urban District Council; Hornsey Gas Company; St. Annes-on-the-Sea Urban District Council.

Public Utility Companies (Capital Issues) Act.

Copies were presented of reports by the Board of Trade under the Act on an application by the Shirebrook and District Gas Company.

Glassware Questions.

Mr. BALDWIN (the President of the Board of Trade), in reply to a question by Mr. GALBRAITH, said that opal glass shades had been produced in considerable quantities in the Birmingham and Stourbridge districts; but depression in the trade had caused several of the works to be shut down, and output was, for the time being, on a very small scale. It was not possible to indicate the number of hands employed on this type of product, as the character of the production in many glass works was subject to constant change. No records were available from which the annual output of this restricted class of goods could be stated.

Sir T. BRAMSDON asked the President of the Board of Trade whether he had considered the fact that the Committee appointed by him in December last to investigate a complaint under the Safeguarding of Industries Act (Part II) in regard to illuminating and other glassware, were instructed to present a report in regard to the import of these goods from Germany and Czecho-Slovakia, and that they did in fact present a report showing their findings as to the combined effect of German and Czecho-Slovak imports upon employment in this country; whether the Committee in question presented any separate reports as to German imports; and, if not, whether he would obtain a report on the effect on unemployment in this country of imports from Germany alone before making an application applying to Germany alone?

Mr. BALDWIN replied that, having regard to the terms of the Committee's report, and to such information as was available respecting imports, he was satisfied that the necessary conditions had been established for the making of an Order with regard to German glassware. The answer to the last part of the question was consequently in the negative.

Sir T. BRAMSDON asked if there had been any understanding with Czecho-Slovakia in regard to this matter.

Mr. BALDWIN said he would deal with the question during the debate on the Safeguarding of Industries Act. He was not prepared to answer the question at the moment.

Lieut.-Colonel Sir F. HALL asked why the recommendation of the Committee appointed by the Board of Trade in regard to illuminating and other glassware imported from Czécho-Slovakia had not been included in the draft of the Safeguarding of Industries (No. 1) Order, 1922, proposed to be made by the Board of Trade; and whether it was the intention of the Government to make a further Order affecting such glassware imported from Czecho-Slovakia.

Mr. BALDWIN said this was one of the matters with which he proposed to deal when the Order comes before the House.

CHESTER GAS BILL.

This Bill, promoted by the Chester United Gas Company [see "JOURNAL" for March 1, p. 495, and May 31, p. 509], was on Wednesday last before the Unopposed Committee of the House of Commons presided over by Mr. JAMES E. HOPE (Chairman of Ways and Means).

Mr. T. SEGAR BERRY (Messrs. Sherwood & Co., Parliamentary Agents) said the Company supplied gas within the city of Chester and in an area outside. They had a capital of some £200,000. The main objects of the Bill were to substitute the basic price for the present maximum price, and to establish a profit-sharing scheme. Under their original Act of 1858, the Company had a maximum price of 4s. 6d. per 1000 c.ft. About twenty years ago, there was put into force a profit-sharing scheme, which allowed for additions to the salaries and wages of the employees of sums varying from 1 to 10 p.ct., according to the reduction in the price of gas.

The CHAIRMAN asked whether the Company had to adapt that scheme to the basic price scheme.

Mr. BERRY replied that the present scheme was not in force under any statutory authority; and the Company, therefore, proposed to take the ordinary powers to establish a scheme. Continuing, he said that before the war the price of gas had been reduced from 4s. 6d. to 2s. 6d. per 1000 c.ft., and the employees were getting a bonus of 7½ p.ct. Then the war came, the price went up, and since then the employees had received no bonus. The dividend paid by the Company on the ordinary stock before the war was 5 p.ct., and the same dividend was being paid to-day. There was only one description of ordinary stock, and there was also preference stock. When the basis of charge was altered from cubic feet to the therm basis, the Company obtained from the Board of Trade a Therm Order, in which the maximum price was put at 1s. 4d. per therm. This was obviously higher than the Company needed. He believed that the Board of Trade could not help this, because they were bound to add the increase of cost of manufacture, &c., to the original price of 4s. 6d. per 1000 c.ft., and in this way they arrived at 1s. 4d. per therm. When the present Bill was promoted, the price was altered to 12·2d. per therm by the Company, who considered the maximum price too high. Certain capital powers were also included; but the Chester Corporation presented a petition against the Bill. A conference then took place, and as a result it was agreed that the Company should strike all the capital powers out of the Bill, and should rely on the powers they could get under the Public Utility Companies (Capital Issues) Act. The Company had £56,020 of unissued capital. The Corporation had said that there must be revision of price by the Board of Trade every three years; and the Company agreed to this. There were other minor amendments. The Corporation could not agree to the stock carrying any higher dividend than to-day; and the Company met them there. As to the question of the basic price, Mr. William Cash had advised the Corporation; and it was agreed that the Company's accountant should meet Mr. Cash and try to arrive at a figure. They accordingly met, and eventually agreed that the price should be 10·4d., in place of the 12·2d. originally in the Bill. At the present time the Company were selling at 11d. per therm, which was higher than the basic price now in the Bill; so that, until they improved the position, and could sell at a lower price, the Bill would give them no advantage.

The CHAIRMAN said he understood that at present the Company had power to sell as high as 1s. 4d. per therm.

Mr. BERRY agreed, and pointed out that they could pay a 5 p.ct. dividend as well. But, of course, if they went below the 10·4d. per therm, then the shareholders and the employees would get a share of the profits.

The CHAIRMAN remarked that in the Windsor case the Committee were practically asked to fix a basic price, for doing which they did not think they had the necessary information; but the Chester case was that the figure had been thoroughly settled between the Company and the Corporation of the City of Chester?

Mr. BERRY said that was so.

Finally, Mr. Berry referred to the clause providing for the division of surplus profits, which set out that all sums to be applied for the benefit of the employee co-partners of the Company should be carried to the "benefit" fund or a co-partnership fund to be established. This phrase was used because the fund was now called a benefit fund, but, as a matter of fact, it was really a co-partnership fund.

Sir ERNEST MOON, K.C., said there was already a co-partnership scheme in existence *de facto* though not *de jure*.

The Committee did not think it necessary to pursue this matter further.

Mr. *William Cash* then gave evidence with regard to his investigations, and handed in the following table:

Memorandum as to Prices, Calculated throughout on 460 B.Th.U. Gas and allowing 1·2d. per Therm addition for Outer Area.

—	Inner Area.		Outer Area.	
	Per 1000 C.Ft.	Per Therm.	Per 1000 C.Ft.	Per Therm.
	s. d.	d.	s. d.	d.
Old standard (Maximum) . . .	4 6	11·7	5 0	12·9
" " (under Order Dec. 15, 1921)	6 1·6	16	6 7·1	17·2
Selling price up to Dec. 31, 1921 .	4 6	11·7	5 0*	12·9
" " after Dec. 31, 1921 .	4 7·2	12	5 0·7*	13 2
Basic prices in Bill as deposited .	4 8·1	12 2	5 1·6	13·4
" " as agreed	3 11·8	10·4	4 5·4	11·6

* Chargeable.

With regard to the division of surplus profits, Mr. Cash said that when the Bill was deposited it was provided that if in any year the selling price shall have gone below the basic price, then, if and so far as the amount standing to the credit of the net revenue account, after providing for dividend on the preference and ordinary capital at the basic rates, permitted, an amount equal to one-half of the sum representing the difference between the amount the Company had received in that year and the sum they would have received in that year if the gas had been sold by therm in the inner area at the basic price, and in the outer area at a price not exceeding the basic price by more than 1·2d. per therm, should be applied for the benefit of the shareholders and of the employee co-partners. Looking at other Bills containing similar provisions as to basic price and dividend, the amount to go to the shareholders and employees was one-third of the difference; and the Company should follow precedents. The other two-thirds would go towards the reduction of the price of gas.

Replying to questions with regard to the basic prices in the area of supply, Mr. Cash said that the Company had a statutory right to charge a higher price outside the City than within, but had extended

the inner area, which now comprised an area within a radius of 2½ miles, wherein they do not in fact charge a higher price.

Mr. C. W. ROGERS (Solicitor to the Company) formally proved the preamble of the Bill, and it was ordered to be reported.

A NEW SMOKE ABATEMENT BILL.

A Bill to "Amend the Law Relating to Smoke Nuisances, and for Other Purposes Connected Therewith" was last Wednesday presented in the House of Lords by the Earl of Onslow, and read the first time. The second reading took place on Monday this week. The following is the text of the Bill:

1.—(1) The provisions of the Public Health Act, 1875, relating to smoke nuisances shall be amended as follows:

(*a*) For the purposes of section 91 of the Act, a chimney (not being the chimney of a private dwelling-house) sending forth smoke in such quantity as to be a nuisance shall be deemed to be a nuisance liable to be dealt with summarily in manner provided by that Act, notwithstanding that the smoke is not black smoke.

(*b*) For the purposes of sections 91, 92, and 102 of the Act, the expression "smoke" shall include soot, ash, grit, and gritty particles.

(*c*) Where the complaint upon which a summons is issued relates to a smoke nuisance, £50 shall be substituted for £5 as the maximum penalty under section 96 of the Act.

(*d*) Section 98 of the Act, in its application to an Order relating to a smoke nuisance, shall be read as if £5 and £10 were substituted therein for 10s. and 20s. respectively.

(2) The provisions of the Public Health (London) Act, 1891, relating to smoke nuisances, and smoke consumption shall be amended as follows:

(*a*) For the purposes of section 24 of the Act, a chimney (not being the chimney of a private dwelling-house) sending forth smoke in such quantity as to be a nuisance shall be deemed to be a nuisance liable to be dealt with summarily in manner provided by that Act, notwithstanding that the smoke is not black smoke.

(*b*) For the purposes of sections 23 and 24 of the Act, the expression "smoke" shall include soot, ash, grit, and gritty particles.

(*c*) Where a notice served under section 4 of the Act relates to a smoke nuisance, £50 shall be substituted for £10 as the maximum penalty which may be imposed under subsection (4) of that section.

(*d*) Where a nuisance order made under section 5 of the Act relates to a smoke nuisance, sub-section (9) of that section and sub-section (3) of section 6 of the Act shall be read as if £5 and £10 were substituted therein for 20s. and 40s. respectively.

(*e*) In sub-sections (2) and (3) of section 23 of the Act (which relate to penalties for non-consumption of their own smoke by furnaces and steam vessels) £25 and £50 shall be substituted for £5 and £10 respectively.

(3) In any proceedings for sending forth smoke from a chimney in such a quantity as to be a nuisance, it shall be a defence for the person charged to show that he has used the best practicable means for preventing the nuisance.

2.—(1) The Minister of Health may, after such inquiry as he deems necessary, and after consultation with any local authorities or other interests concerned, make orders—

(*a*) extending the list of noxious or offensive gases mentioned in section 27 of the Alkali, &c., Works Regulation Act, 1906; and

(*b*) extending the list of works mentioned in the first schedule to the said Act;

and any such Order may prescribe the qualifications subject to which sub-section (1) of section 7 of the said Act shall apply in the case of any noxious or offensive gas or in the case of any works included in such Order.

(2) Any Order made under this section shall be laid before Parliament as soon as may be after it is made, and shall have effect as if enacted in this Act:

Provided that, if an address is presented to His Majesty by either House of Parliament within the next subsequent 21 days on which that House has sat next after any such Order is laid before it, praying that the Order may be annulled, His Majesty in Council may annul the Order, and it shall thenceforth be void, but without prejudice to the validity of anything previously done thereunder, or to the making of a new Order.

3.—The powers of an urban authority under section 157 of the Public Health Act, 1875, and of the London County Council under section 164 of the London Building Act, 1894, shall extend to the making of bye-laws requiring the provision in new buildings other than private dwelling-houses of such arrangements for heating as are calculated to prevent or reduce the emission of smoke.

4.—Two or more local authorities may combine to carry out their duties under section 92 of the Public Health Act, 1875, in respect of smoke nuisances, and for that purpose may concur in appointing a joint committee to which the provisions of section 57 of the Local Government Act, 1894, shall apply.

5.—(1) If a county council resolve that a local authority have failed to carry out their duties under section 92 of the Public Health Act, 1875, in respect of smoke nuisances and make complaint thereof to the Minister of Health, the Minister may, after such inquiry as he deems necessary, by order authorize the county council to carry out such duties either for a definite period or until the Minister shall otherwise direct.

(2) Any expenses incurred by a county council in carrying out such duties shall be a debt from the local authority to the county council, and shall be defrayed as part of the expenses of the local authority in the execution of the Public Health Acts.

6.—(1) This Act may be cited as the Smoke Abatement Act, 1922.

(2) This Act shall not apply to Scotland or Ireland.

MISCELLANEOUS NEWS.

REDUCED GAS PRICES IN LONDON.

The Gas Light and Coke Company.

A promise was recently made by the Gas Light and Coke Company that there would be a substantial reduction in the price of gas as from the reading of the meters for the June quarter, and this has been fulfilled now by the notification of a lowering of the charge from 1s. 1d. to 11d. per therm.

This reduction, the Company state in the notice to their customers, represents a saving to the consumers of over £1,200,000, and following upon a reduction of 1d. per therm in December last, brings the total savings to the consumers up to over £1,800,000 a year. This is consequently 3d. below the high-water mark of 1s. 2d. in 1921.

In a statement dealing with the meaning of the word "therm," the Company point out that the idea entertained in some quarters that the new system of charge is a device of the gas companies to get more out of the public is entirely unfounded. The system—a perfectly fair and improved system—was suggested by an entirely independent body of scientific men, and was approved by the Board of Trade, the London County Council, the City Corporation, and other local authorities concerned in safeguarding the public, and its introduction is being followed by a steady and substantial reduction in cost to the public.

To enable the utmost possible reduction to be made in the price of gas, the Company further state, and so give the greatest benefit to those consumers who burn the most gas in proportion to the size of meter employed, the Company have revised their charges for meter rents, and give notice that, as from Oct. 1 next, rents will be charged for meters throughout their district at rates which are approximately, but in no case more than, 50 p.ct. above the rents now charged. The Company have also decided that the concession of "no rents for meters" enjoyed hitherto by consumers in the area of the City of London shall be withdrawn as from Sept. 30, in order that consumers throughout the Company's district may be placed on terms of equality in regard to all charges incidental to the supply of gas. The total result of this revision is to provide some £35,000 to go towards the £1,200,000 represented by the reduction in the price of gas.

Finally, the Company say: "Every indication points to further reduction in the price of gas in the future, should favourable conditions continue."

The following is to be the rent of meters as from Oct. 1 next:

Size of Meter.	Rent per Quarter. £ s. d.	Size of Meter.	Rent per Quarter. £ s. d.
3 lights	0 0 7	150 lights	0 16 6
5 ,,	0 1 1	200 ,,	1 1 0
10 ,,	0 1 10	250 ,,	1 6 3
20 ,,	0 2 8	300 ,,	1 11 3
30 ,,	0 3 9	400 ,,	2 2 6
50 ,,	0 5 6	500 ,,	2 12 6
60 ,,	0 7 0	600 ,,	3 3 0
80 ,,	0 9 0	1000 ,,	4 7 0
100 ,,	0 12 0		

South Metropolitan Gas Company.

The Directors of the South Metropolitan Gas Company have intimated to their customers that, from the date of reading the meters for the Midsummer quarter, the price of gas has been reduced from 11½d. to 1. per therm.

THE GAS LIGHT AND COKE COMPANY'S METER-RENTS.

Cancelling an Agreement with the London County Council.

The Public Control Committee reported at last week's meeting of the London County Council that the Gas Light and Coke Company had made formal application for the cancellation of an agreement which was made in 1907 between the Council and the Company on the subject of the limitation of meter rents; and they recommended that the agreement be cancelled. In order that the matter might be properly considered in all its bearings, the Committee said, it was necessary to remind the Council of the history of this question. This they did in their report.

The charges made by the Metropolitan Gas Companies for the use of meters are governed by section 14 of the Metropolis Gas Act, 1860; but the Gas Light and Coke Company are under a special restriction as regards the area of the City of London, and in that district, though bound to supply meters for the use of consumers, are precluded under the Great Central Gas Consumers' Act, 1851, from charging rents for such meters. It was owing largely to this differentiation between consumers within and without the City that the Company were induced in 1895 to adopt the policy of not charging meter rents in any part of their area. The matter was reconsidered in 1903, when both the Council and the Company introduced Bills into Parliament for the purpose, among others, of reducing the Company's standard price for the supply of gas below the figure of 3s. 9d. per 1000 c.ft., at which it then stood. As the result of negotiations, an agreement was arrived at that the following statements should be made to the Committee of Parliament who were then considering the Council's Bill providing for a standard price of 3s. 3d. For the Company it was stated that: "The policy of this Company is not to charge meter rents, and the Directors have no intention of reimposing the charge in the case of ordinary consumers, but they object to the power of making the charge being taken away from them while it is both retained and exercised by the other Metropolitan Companies." For the Council it

was stated that: "The Council have assented to the standard price of 3s. 3d., as proposed by their Bill, being altered to 3s. 4d. The Council agree to the standard price being fixed at this figure, relying upon the assurance given on behalf of the Company as to their policy with respect to meter rents." These terms were approved by the Select Committee and assented to by the Company. The Council's Bill was subsequently withdrawn, and the Company's Bill became law—the standard price being fixed at 3s. 4d. per 1000 c.ft.

In 1907 the Company, finding it necessary to raise additional revenue in consequence of increases in the prices of coal and oil, approached the Council with a proposal that, instead of raising the price of gas, they should re-impose a charge in respect of meters. After full consideration of the proposal, the Council resolved: "That no objection be offered to the Company charging meter rent on the scale submitted, except that the annual meter charge for 3-light meters shall not exceed 1s. 8d., and subject to the Company giving an undertaking: (i) That the authorized dividend which the Company is enabled to declare shall in future be calculated as if the price of gas were 1d. per 1000 c.ft. higher than that actually charged; and that the necessary provision to give effect to this be embodied in the next Bill which the Company introduces into Parliament. (ii) That the price of gas to the Company's ordinary consumers north of the Thames will not be increased beyond the present price of 2s. 11d. per 1000 c.ft. for a period of one year from June 24, 1907."

The undertaking was accordingly completed. The provision therein that the authorized dividends should be calculated as if the price of gas were 1d. per 1000 c.ft. more than the price actually charged, was inserted in order that the shareholders should not obtain any advantage from the imposition of meter rents by way of a higher dividend than that to which they would have been entitled, under the sliding-scale, if the additional revenue had been obtained by raising the price of gas. This arrangement was made permanent by the Gas Light and Coke Company's Act, 1909, by which the standard price was reduced from 3s. 4d. to 3s. 2d. per 1000 c.ft., 1d. of this reduction being conceded in fulfilment of the undertaking given to the Council.

The Company, in their recent letter asking for a cancellation of the agreement referred to above, stated that, with the increased cost of meters, they now have to bear a serious annual loss in connection with this side of their business. This loss has to be made up in the price charged for gas, and the present arrangement "places the Company in a position of disadvantage, both in meeting competition in business and in comparison with other Metropolitan Companies." The Company therefore urged that the Council should consent to the agreement of 1907 being cancelled, leaving the Company free, within the limitations of the law, to charge meter rents on a fair and proportionate scale.

It is obvious, the Committee went on to say, that if meters are rented at a loss to the Company this loss must be made good out of the revenue from the sale of gas and (or) from the hire of stoves and fittings. It follows that such an arrangement tends to favour unduly those consumers who take a supply wholly or partly for stand-by purposes, at the expense of other consumers who take comparatively larger quantities of gas through their meters. In the interests of the Company's consumers as a whole it is desirable to aim at securing that each consumer should, as far as possible, bear the cost of his own supply, including all incidental expenses. While an increase in meter rents would tend to secure this end in the larger portion of the Company's area, it would, on the other hand, emphasize the advantage enjoyed by consumers in the City of London.

Having compared the meter rents at present charged by the South Metropolitan and Commercial Gas Companies with those which the Gas Light and Coke Company propose to make (the latter representing an increase of about 50 p.ct. on the existing charges), it appears to the Committee that the suggested charges are, in most cases, rather less than those made by the Commercial Company. The proposed charge for a 5 light meter is, however, 4d. more, and that for a 10-light meter 1s. 4d. more. As compared with the charges made by the South Metropolitan Gas Company for new meters, the proposed charges for small meters are substantially lower than those of the latter Company.

The Gas Light and Coke Company estimate that the proposed increases of meter rents would produce additional income of about £30,000 a year. In order to compensate the consumers for the additional charge, the Company propose to reduce the price of gas by ¼d. per 1000 c.ft., which is equivalent to 0·052d. per therm. It is stated by the Company that this reduction would be equivalent to a loss of revenue of about £33,000 a year. The Committee understand that the Company have under consideration the question of making a larger reduction due to other causes, but have no information as to the extent of this possible decrease.

With regard to the effect of a reduction of price on the dividend on the ordinary stock of the Company, no additional dividend could be authorized unless the price were reduced by 0·2d. per therm during the whole of any half year. The shareholders would not, therefore, be entitled to any additional dividend in respect of the proposed reduction of ¼d. per 1000 c.ft. To secure additional dividend it would be necessary to make a further reduction of 0·148d. per therm for other reasons. A reduction of 0·2d. per therm would allow of an increase of dividend to the extent of 2s. 8d. p.ct. a year, of which 8 3d. would be due to the proposed reduction of ¼d. per 1000 c.ft. The possible effect of the Company's proposal on the dividend would be so slight that the Committee have not thought it neccessary to suggest any provision for securing that the whole benefit of the proposed reduction of price should accrue to the consumers.

The effect of increasing the meter rents will be considered in connection with any revision of the Company's standard price, and under the Gas Regulation Act, 1920, the Council may at any time apply to the Board of Trade for a reduction of the standard price. The Board are required to revise the standard price if it is shown to their satisfaction that the costs of the production and supply of gas have substantially altered since the standard price was last fixed, from circumstances beyond the control of, or which could not reasonably have been avoided by, the undertakers. From the point of view of the Council as a gas consumer, the increase of the meter rents paid by the Council by 50 p.ct. would result in an additional charge of about £130 a year. On the other hand, a reduction of ¼d. per 1000 c.ft. of gas consumed by the Council would result in a saving of about £170 a year. The net result of the Company's proposal would, therefore, represent a saving of about £40 a year on payments amounting to over £40,000 a year.

After full consideration of all the circumstances, the Committee felt that they could not resist the view that the Company should be placed in the same position as other companies as regards the freedom to formulate such scale of charges for meter rents as they may deem desirable within the limits prescribed by the Metropolis Gas Act, 1860. This can only be effected by abrogating the agreement entered into in 1907.

The report was received, and the recommendation agreed to without comment.

GAS REGULATION ACT APPLICATIONS.

The following further notices have appeared in the "London Gazette" regarding applications to the Board of Trade for Orders under the Gas Regulation Act.

Glyncorrwg Urban District Council.

The maximum price now authorized in respect of the supply of gas by the undertakers is 7s. 6d. per 1000 c.ft.; and the price they have asked the Board of Trade to substitute for this is 1s. 8d. per therm.

DECLARATIONS OF CALORIFIC POWER.

Bordon and District Gas Company.—500 B.Th.U. (Sept. 29.)
Brynmawr and Blaina Gas Company.—450 B.Th.U. (Oct. 1.)
Littleborough Gas Company.—500 B.Th.U. (Sept. 16.)

SPECIAL ORDER.

Ashton-in-Makerfield Urban District Council.

Application to the Board of Trade for a Special Order under section 10 is to be made by the Council, to authorize them to erect and carry on gas-works on scheduled land, to make further provision with regard to the supply of gas, and for other purposes.

GAS REGULATION ACT ORDERS.

We have received from the Director of Gas Administration copies of the following further Orders made by the Board of Trade under section 1 of the Gas Regulation Act.

Barnstaple Gas Company.

After the declared date: (i) The standard price in respect of gas supplied by the undertakers shall be 13·6d. per therm; (ii) "14d." shall be substituted for "3s. 8d." in the first proviso to sub-section 1 of section 22 (price of gas with sliding-scale as to dividend) of the Barnstaple Gas Order, 1910.

For the purpose of ascertaining the authorized rate of dividend, any price charged per 1000 c.ft. before the declared date shall be rendered into the equivalent price per therm by dividing it by five.

After the declared date, the price of 13·6d. per therm shall be substituted for the price of 3s. 10d. per 1000 c.ft. mentioned in the second proviso to sub-section (1) of section 22 of the Barnstaple Gas Order, 1910.

After the declared date, "1·2d. per therm" shall be substituted for "6d. per 1000 c.ft." in sub section (2) of section 22 of the Barnstaple Gas Order, 1910.

Prepayment meter clauses are included. (July 20.)

Bordon and District Gas Company.

After the declared date, the maximum price in respect of gas supplied by the undertakers shall be 19·4d. per therm.

Prepayment meter clauses are included. (July 12.)

Horley District Gas Company.

After the declared date, the standard price in respect of gas supplied by the undertakers shall be 17·8d. per therm.

For the purpose of ascertaining the authorized rate of dividend, any price charged per 1000 c.ft. before the declared date shall be rendered into the equivalent price per therm by dividing it by four-and-one-half. (July 17.)

Lewes Gas Company.

After the declared date, the maximum prices in respect of gas supplied by the undertakers shall be 20d. and 22·4d. per therm; and these prices respectively shall be substituted for the prices of 6s. and 7s. per 1000 c.ft. mentioned in section 55 (limiting price of gas) of the Lewes Gas Act, 1878. (July 13.)

Milton Regis Urban District Council.

After the declared date, the maximum price in respect of gas supplied by the undertakers shall be 17·2d. per therm.

After the declared date, the price of 17·2d. per therm shall be substituted for the price of 5s. 6d. per 1000 c.ft. mentioned in paragraph (13) of Article VI. of the Milton-next-Sittingbourne Order, 1884.

After the declared date, the price of 13·6d. per therm shall be substituted for the price of 4s. per 1000 c.ft. mentioned in paragraph (ii) of Article VI. of the Milton-next-Sittingbourne Order, 1884. (July 19.)

Strabane Gas Profit.—The balance-sheet submitted to the Strabane Urban District Council by the Gas Committee showed that a million c.ft. less gas was consumed in the year ended in March last than in the previous year; but owing to the higher price charged, there was an increase on gas sales amounting to £54. The balance of net profit is nearly £900.

BIRMINGHAM CORPORATION ACCOUNTS.

We have received from Mr. J. R. Johnson, F.S.A.A. (Acting Treasurer of the City) a copy of the Birmingham Financial Statement for the year ended March 31 last, which shows that the total revenue of the Corporation during the year under review was £13,048,423; the expenditure, £12,851,192. These figures, of course, include the trading accounts of the Corporation. The rateable value of the city at March last was £5,504,441. Glancing at the figures relating to the gas undertaking, it is seen that the revenue account showed a balance of income in excess of expenditure for 1921-22 of £187,961, which was carried to the profit and loss account. After providing for annuities, interest, and redemption of debt, this account exhibited a profit of £20,215, which was transferred to special maintenance account. There was no capital expenditure during the year. At March last the total expenditure on capital account was £2,993,028, and the gross amount of loans negotiated (including annuities) was £3,008,949. The amount standing to the credit of the reserve fund was £72,779. In the year under notice there was a sum provided from revenue for redemption of debt of £66,744; the gross amount so provided to the end of 1921-22 being £1,624,927. The balance of loans remaining to be provided for was £1,384,022.

BIRMINGHAM GAS PRICES.

The Birmingham Gas Committee prepared for presentation to yesterday's meeting of the City Council a report in relation to the price of gas. They state that, as the result of reduced cost of coal and economies effected in various directions, they are in a position further to reduce the price of gas, and, in accordance with the policy approved by the Council, they recommend that, as from the Michaelmas reading of the meters, the following scale of charges be adopted:

For Lighting, Cooking, and Domestic Purposes in One Premises.

	Per 1000 C.Ft. From		To.	
	s.	d.	s.	d.
Up to and including 100,000 c.ft. per quarter	4	6	3	10
Quantity in excess of—				
100,000 c.ft. to 500,000 c.ft. per qr.	4	5	3	9
500,000 ,, ,, 1,000,000 ,, ,,	4	3	3	7
1,000,000 ,, ,, 2,000,000 ,, ,,	4	2	3	6
2,000,000 ,, ,, 3,000,000 ,, ,,	4	0	3	4
3,000,000 ,, ,, 4,000,000 ,, ,,	3	9	3	1
4,000,000 ,, per quarter	3	6	2	10

For Manufacturing and Motive Power in One Premises.

Up to and including 1,000,000 c.ft. per qr.	4	0	3	4
Quantity in excess of—				
1,000,000 c.ft. to 2,000,000 c.ft. per qr.	3	9	3	1
2,000,000 ,, ,, 3,000,000 ,, ,,	3	6	2	10
3,000,000 ,, ,, 4,000,000 ,, ,,	3	3	2	7
4,000,000 ,, per quarter	3	0	2	4

The above prices are subject to 5 p.ct. discount for prompt payment.

The number of cubic feet supplied per penny through prepayment meters will be as follows:

—	Installations in Use less than Ten Years. C.Ft.	Installations in Use Ten Years and Upwards. C.Ft.
With meter only	From 18½ to 21½	From 18½ to 21½
With meter and Corporation fittings	,, 17½ ,, 20½	,, 18½ ,, 21½
With meter and Corporation cooker	,, 17 ,, 19½	,, 17½ ,, 20½
With meter and Corporation cooker and fittings	,, 16 ,, 18½	,, 17½ ,, 20½

For the information of the Council the following table is given, showing the percentage increases in each case over the Midsummer, 1915, charges:

Ordinary Consumers.

Lighting and Domestic only. C.Ft.	Increase over Midsummer, 1915. P.Ct.	Manufacturing and Motive Power. C.Ft.	Increase over Midsummer, 1915. P.Ct.
100,000	91·67	1,000,000	110·53
500,000	94·83	2,000,000	113·89
1,000,000	95·13	3,000,000	117·65
2,000,000	102·11	4,000,000	115·15
3,000,000	108·07		
4,000,000	112·90		

The Finance Committee concur in the proposals of the Gas Committee, and remind the Council that until the expiration of the Birmingham Gas Order, obtained under the Statutory Undertakings (Temporary Increase of Charges) Act, 1918, the Gas Committee are prohibited for the present from transferring any sums to the relief of the rates.

Ashbourne Plant Extensions.—Mr. A. W. Brightmore, B.Sc., held an inquiry recently at Ashbourne, into an application by the Urban District Council for sanction to borrow £12,000 for the extension of the plant at the gas-works and the laying of new mains. The Clerk to the Council (Mr. R. Williams) explained that the output at present was 45 million c.ft. a year; and the recognized capacity of the plant was barely 32 million c.ft. In 1914, the Council purchased the gas-works and some cottages with gardens; the total cost being £49,002. Evidence in support of the application was given by Mr. T. Kennedy (the Chairman of the Gas Committee), Mr. H. G. Harrison (the Gas Manager), and Mr. L. Rose (the Chairman of the Council). Mr. W. H. Foster opposed the scheme, and urged that it should be postponed until the cost of materials came down.

SHEFFIELD GAS COMPANY.

Scale of New Charges for Gas.

The following reduced scale of charges for gas has been fixed by the Sheffield Gas Company, to come into operation as from the beginning of the quarter commencing October next:

	Per Therm.	Present Prices.
For gas supplied in quantities up to 100,000 c.ft.	8d.	8½d.
For the excess beyond 100,000 c.ft. up to 500,000 c.ft.	6½d.	7½d.
,, ,, 500,000 c.ft. up to 3,000,000 c.ft.	6½d.	7½d.
,, ,, 3,000,000 c.ft. up to 6,000,000 c.ft.	6½d.	7½d.
,, ,, 6,000,000 c.ft.	6½d.	7½d.

The "Sheffield Telegraph" says: The decrease means a very substantial reduction, even in household bills; but it will be still more important to industry, and should have a very useful effect in hastening that trade revival for which we are all hoping. We believe it is a fact that the Gas Company have calculated on the narrowest possible margin in order to give the maximum relief; and we may congratulate both the Directors and the General Manager (Mr. Ralph Halkett) on this new evidence of a sound and progressive policy.

HEYWOOD CORPORATION GAS-WORKS REPORT.

Reporting on the operations for the financial year ended March 31 of the Heywood Corporation Gas Department, Mr. W. Whatmough (the Engineer and Manager) says the gross revenue amounted to £42,992, and the expenditure to £37,844, leaving a gross profit of £5148. This represents an increase of £1351, and is equal to a yield of 5 p.ct. on the actual amount of capital expended. Interest and sinking fund, however, require £7587, which leaves a net deficiency of £2439.

The increased charge for gas yielded an extra income of £2281; but unfortunately the heavy slump in prices of bye-products shows the large decrease of £4394, leaving a net decreased income of £2107. Expenditure shows a decrease of £3459; and had it not been for the increased cost of £3000 entailed by the coal strike, together with additional cost of £961 for interest and sinking fund, there would have been a balance to credit of £1522, instead of a deficit on the year's working.

During the year 7944 tons of coal were carbonized, and 954 tons of coke used for water-gas manufacture; the average make per ton being 15,592 c.ft., or 14,193 c.ft. coal equivalent. The total quantity of gas manufactured was 138,740,000 c.ft., an increase of 2,014,000 c.ft.; and the amount sold as registered by consumers' meters was 124,356,920 c.ft., an increase of 22,920 c.ft. The leakage or unaccounted-for gas was 8·62 p.ct.

The gas consumption is still 12,559,000 c.ft. less compared with pre-war, which represents a loss of net income amounting to £1500, and equal to 2½d. per 1000 c.ft. for fixed charges. The reduced consumption in dwellings and shops amounts to 13,000,000 c.ft., public lighting 3,000,000 c.ft., and mills and workshops 9,000,000 c.ft., equal to 50 p.ct.; but there is an increase of 3,000,000 c.ft. for stoves and motive power and 9,000,000 c.ft. for prepayment meters. Bad trade and electric competition are the causes of this heavy decrease, especially the latter; and the future business of the department will be the development of supply for heating purposes, as gas is more efficient and cheaper than electricity. Much progress, however, cannot be expected until there is less unemployment and revival in trade; but the question of special rates for large consumers will require to be considered, as the charge for electricity for large power users is at a very low rate.

The renewal of the vertical retorts (which were guaranteed for three years, and remained in use seven) has proved very costly, as material and labour have been at a very high rate. Under normal conditions, a sum would have been set aside annually for renewals; but in the hope of prices of material and labour falling, and in order to keep the price of gas as low as possible during the past seven years, this has not been done—so that gas has been supplied at less than cost price.

Mr. Whatmough concludes: The prospect for the coming year is much brighter, as the price of coal and labour will be considerably less, and with this in view the Committee have decided to reduce the price of gas 3d. per 1000 c.ft., which represents £1500 at the present annual rate of consumption. The past year has been a very difficult and anxious one—especially during the coal strike—and it should be placed on record that during the whole of that period the Committee determined at all costs to stand by the community and maintain the supply of gas, which, unfortunately, has prevented them from showing a profit for the financial year.

Sunderland Gas Cheaper.—The Sunderland Gas Company have reduced the price of gas to 3s. per 1000 c.ft., less discount ranging from 1d. to 6d.

Stirling Gas Light Company.—The Company had less receipts from residuals last year, as compared with the previous year, of £12,647. The balance at credit of profit and loss was £6188. Dividends are recommended for the year of just over 9s. on each original share of £5 7s. 6d., and of 10s. 6d. per share on each new ordinary share of £10.

Aylesbury Gas Company's Area of Supply.—The Hertfordshire County Council, reporting on the application of the Aylesbury Gas Company to the Board of Trade under section 10 of the Gas Regulation Act for a Special Order enabling them to purchase the undertaking of the Wendover Syndicate, Ltd., and to extend the Company's limits of supply so as to include the parishes of Puttenham, Tring Urban, Tring Rural, and Wiggington, all within the county of Hertford, state that objections were lodged with the Board of Trade, who have now written stating that they have decided not to authorize the Aylesbury Gas Company to supply gas in any parish within the county of Hertford.

STRATFORD-ON-AVON GAS PROFIT.

In his first annual report on the working of the Stratford-on-Avon Corporation Gas Department, Mr. Frederick Shewring (the Engineer and Manager) states that the gross profit for the year ended March 31 is £4669, an increase of £853 on the previous twelve months. The outstanding feature of the results is, however, that a net profit of £195 has been made, compared with a loss of £756 last year. This has been attained in spite of the fact that the average cost of coal has been 4s. per ton more than last year.

On repairs and renewals of works and plant £400 more has been spent. Maintenance of mains and services cost £1000, against £583, meters and meter repairs costs increased by £332, and repayment of loans and interest required £297 more than in the previous year. Turning to the revenue account, the larger volume of business in gas sales accounted for an increase of £2634. Sales of fittings increased by £1050, largely due to the opening of a temporary showroom and the re-organization of the fitting department. Tar and ammonium sulphate sales are down by £826, owing to the low prices ruling for these commodities. Mr. Shewring expresses the opinion that the results prove that the policy adopted by the Committee in carrying out certain improvements to the works has been a sound one.

The total quantity of gas made in the past year was 90,668,000 c.ft., or an increase of 3,331,000 c.ft., while the make per ton of coal carbonized (at 14.749 c.ft.) also shows an increase of 1689 c.ft. At the same time the gas unaccounted-for has been reduced from 11·6 p.ct. to 9·5 p.ct.

The report was presented to the Town Council on the 10th inst., when the price of gas was reduced 6d. per 1000 c.ft., with an additional concession of 1d., 2d., and 3d. per 1000 c.ft. to power users, according to consumption, as from the June quarter meter readings. The following tenders were accepted: Boiler house and foundations, £540; Lancashire boiler and superheater, £1335; and chimney stack, £253. On Mr. Shewring's recommendation, it was decided to purchase fifty new street-lamps, to improve the public lighting.

PRICE OF GAS AT HARTLEPOOL.

Within the past few days, a deputation from the Hartlepool Corporation has waited upon the Directors of the Hartlepool Gas and Water Company, with the object of gaining a reduction in the price of gas, which now stands at 5s. per 1000 c.ft. Councillor C. H. Parkinson, who stated the case for the Corporation, said there was no objection to the application to alter the system of charge from cubic feet to therms. The present charge, he said, was higher than was general throughout the district. While he admitted that during the last year the Company had no doubt suffered a heavy loss due to the coal strike and the reduced market value of coke and other residuals, this period had passed. He contended that the balance of revenue over expenditure, on an estimated average charge of 4s. per 1000 c.ft., was £20,187; and this upon the present cost of coal, and manufacturing and other expenses, which showed a tendency to come down. The maintenance of the present charges was accentuating public feeling. There was a dual system of lighting in the town; and the rate of 4d. per unit for electric light, charged in previous days, still existed. The Chairman of the Company thanked the deputation for the courteous and reasonable way in which the case had been presented, and said the Directors would be shortly going through the half-yearly accounts, and were hopeful that they would be in a position to make some reduction.

Illingworth Carbonization Company, Ltd.—This is the title of a private company just registered, with a capital of £21,400, in £1 shares. The office is at No. 16, Kennedy Street, Manchester.

Further Reduction at Newport (Mon.).—The Newport (Mon.) Gas Company announce a further reduction in the price of gas by 1d. per therm, equivalent to 4½d. per 1000 c.ft. The rentals of meters and cookers are also to be reduced 20 p.ct.

Vincent Northcote Syndicate.—The Vincent Northcote Syndicate has been registered, with a capital of £1100, to carry on business as manufacturers of geysers, cooking and gas heating stoves, and atmospheric gas and paraffin vapour burners. The address is No. 8, St. John's Hill, Clapham Junction, S.W.

Ownership of the Dysynni Gas-Works.—Replying to a question at a meeting of the Towyn-Aberdovey Urban Council last week, the Clerk said that the Council had not yet decided to purchase the Dysynni Gas-Works, but had resolved that the purchase was desirable, and that steps be taken with this end in view. The Clerk was instructed to invite offers for making a valuation.

Reduction at Brierley Hill.—The Directors of the Brierley Hill Gas Company announce that, as from the Midsummer reading of the meters, the price of gas will be reduced by 6d. per 1000 c.ft. for domestic purposes, and 1s. for power. In addition to this reduction, it has been decided to re-start the free maintenance system, under which consumers may have their fittings, &c., periodically examined and adjusted without any charge being made, and any materials which it is found require renewing are supplied at cost price.

Borrowing Powers at Smethwick.—A Ministry of Health inquiry was held at Smethwick last week, regarding an application by the Council to borrow £13,328 for extensions at the gas-works, and £6000 for working capital. The Town Clerk said that for some time the plant had not been sufficient to cope with the demands for gas, and the necessity for increasing the output had become urgent. New industries were starting in the town, and it was anticipated that the consumption would continue to grow. Councillor G. W. B. Stephen (the Chairman of the Gas Committee) also spoke as to the need for reconstruction and extension, and said that last year the demand was so great that they might have had to appeal to Birmingham for assistance. The Inspector visited the works.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *July* 24.

Pitch in the London tar products market continues in good demand; there being plenty of inquiry for next season's delivery. The prices indicated are in the neighbourhood of 75s. to 77s. 6d. per ton net at sellers' works. Deliveries of tar for road work are well maintained. Creosote is a good market, and is firm at 6½d. per gallon net and naked at makers' works. Pure benzole and pure toluole stand at about 2s. 6d. per gallon; 95-160 solvent naphtha at about 2s. 3d. per gallon net and naked at sellers' works. In other products, there is no change to report.

Tar Products in the Provinces.

July 24.

The average values for gas-works products during last week were: Gas-works coal tar, 43s. to 48s. Pitch, East Coast, 76s. to 78s. f.o.b. West Coast—Manchester, 70s. to 72s. 6d.; Liverpool, 71s. to 73s. 6d.; Clyde, 75s. to 77s. 6d. Benzole 90 p.ct. North, 2s. to 2s. 1d.; crude 65 p.ct. at 120° C., 1s. 1½d. to 1s. 3d. naked at makers' works; 50-90 p.ct., naked, North, 2s. to 2s. 1d. Toluole, naked, North, 2s. to 2s. 3d. nominal. Coal tar crude naphtha in bulk, North, 8½d. to 9½d. Solvent naphtha, naked, North, 1s. 8d. to 1s. 10d. Heavy naphtha, North, 2s. to 2s. 1d. Creosote, in bulk, North, liquid, 5⅝d. to 6d.; salty, 5⅜d. to 5⅝d. Scotland, 4¾d. to 5d. Heavy oils, in bulk, North, 6¼d. to 6½d. Carbolic acid, 60 p.ct., 2s. 1d. to 2s. 2d. Naphthalene, £12 to £15; salts, £5 to £5 10s., bags included. Anthracene, "A" quality, 5d. per minimum 40 p.ct., purely nominal; "B" unsaleable.

Manchester District Tar Prices.

The average price realized for the sale of tar in the Manchester district, according to the sliding-scale, for the month of June was £2 12s. 0·57d. per ton.

FROM A MARKET CORRESPONDENT.

Bye-Products Trade.

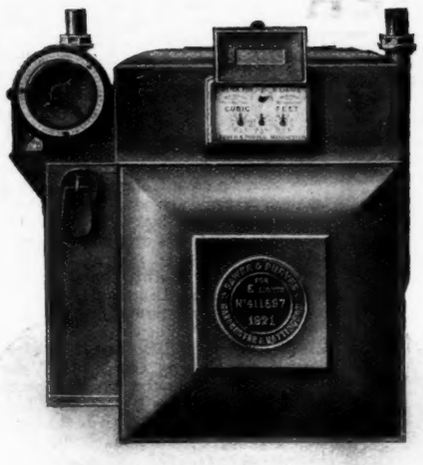
The bye-products market still remains very firm; the demand being rather greater than the present supply. Distillers are somewhat short of tar; and while so much of it is going on to the roads, it is difficult to see how this position can be altered until more coke-ovens get back to work. At the same time there is some shortage of tar for road purposes in the South of England, and makers are finding it difficult to cope with the demands. The position in pitch still remains very strong. Supplies are scarce, and there are reports of trouble in connection with forward sales. Makers' ideas are still moving in the upward direction. There is a good demand in South Wales, and 85s. per ton is easily obtained; while there are rumours of 92s. 6d. having been paid. In the North of England, the market is very firm at 75s., which also is the London quotation f.o.b. Solvent naphtha is in poor demand, inquiries coming in at long last from the rubber manufacturing industry. It is probable that the demand will increase faster than the supply. The latest value is 1s. 8d. to 1s. 9d. per gallon. There is a very fair business in creosote at 5⅝d. to 6d. per gallon. In carbolic acid there is very little doing, largely on account of the indifference of makers to extract while the price does not offer any reasonable profit. The nominal price of crude 60's is 1s. 10d. per gallon and of 40 p.ct. crystals 5⅝d., and until the price of crystals advances it is fairly obvious that manufacturers cannot pay more than 1s. 10d. for their crude. Cresylic acid is steady at 2s. 4d. per gallon for pale 97-99 p.ct., and 2s. for dark 95-97 p.ct.; and good business has been done for early shipment. Naphthalenes are quiet, with crudes as low as £4 per ton, ranging up to £7 per ton; refined £17 per ton. Benzole 90 p.ct. still remains at 1s. 11d. a gallon, and pure benzole only in poor demand at 2s. 4d. Business in intermediate products has been rather better on both home and export account. An increased number of small purchases has been made.

Sulphate of Ammonia.

There is nothing to report in sulphate of ammonia, except that the strong export demand noted recently has been continued. The home trade remains about the same, and no material expansion of business is to be looked for until September. Home prices keep at £16 3s. per ton for neutral 25¾ p.ct., and £15 per ton for ordinary 25¼ p.ct. Export prices are £16 10s. to £17 per ton, according to port.

Pitlochry Gas Company.—The Company have a net profit for the year of £973, and have declared a dividend of 10 p.ct., free of income-tax. The price of gas is reduced by 10d., making it 8s. 4d. per 1000 c.ft. for all purposes.

The Gas Light and Coke Company's Special Order.—On a recommendation of the Parliamentary Committee last April, the London County Council gave instructions for the application by the Gas Light and Coke Company for a Special Order under the Gas Regulation Act to be opposed with a view to securing the deletion of the clause giving power to lay pipes through parts of premises for the supply of other parts and the clause as to construction and placing of pipes, &c. The Committee communicated with the promoters, who agreed not to proceed with the first-named clause, and to amend the other clause in such a manner as to meet the Council's objections. The Committee accordingly gave instructions for the notice of objection to the Order to be withdrawn.



The "Victory"

PREPAYMENT METER

WITH

PLATE PRICE CHANGER.

❖ ❖ ❖

OUTSIDE VALVE BOX.

❖ ❖ ❖

EVERY PART INTERCHANGEABLE.

❖ ❖ ❖

MADE BY

THE PIONEERS

OF THE SLOT METER,

SAWER & PURVES

(BRANCH OF METERS LIMITED),

MILES PLATTING, RADFORD ROAD,

MANCHESTER. NOTTINGHAM.

45-47, Westminster Bridge Rd., LONDON, S.E.

Dungarvan Lighting.—The Dungarvan Gas Company refused to tender for the lighting of the town, owing to the unsettled conditions prevailing and the danger of shortage of supplies. The local Council have therefore given the contract to the Electric Lighting Company.

Dublin Gas Matters.—The Alliance and Dublin Consumers' Gas Company have lodged a claim for £9769 in respect of damage and loss arising from the destruction of property during the recent conflict between the Free State Army and the anti-Treaty revolters in the city. The Corporation have also raised an objection to the Blackrock Urban Council's proposed Order for the introduction of an electric lighting scheme in that district; the contention being that the Gas Company are the only authority who should have a right to supply lighting there.

Mansfield Gas Undertaking.—In welcome contrast to the unremunerative experience of the previous twelve months, when a loss of £2669 was incurred, the accounts for the past year relative to the Mansfield Corporation gas undertaking, which is the largest municipality in Nottinghamshire outside the county town, show a profit of £613. The amount derived from the sale of gas was about £7970 more than in the previous year; but residuals realized £5408 less. The total expenditure on revenue account, however, was about £2355 lower than in the previous period. The year's production of gas and the maximum day's consumption were the highest on record for Mansfield.

Price Reductions in Scotland.—The Kirkintilloch Town Council have lowered the price of gas to 3s. per 1000 c.ft., a reduction of 1s. This is for gas of a calorific value of 460 B.Th.U. Dumfries gas is lowered in price by 6d., making the rate for ordinary consumers 4s. 2d. per 1000 c.ft., and gas-engines 3s. 11d. It is understood that in due course new plant will be installed at the works. The Kirkcaldy Gas Department have reduced the price of gas by 1s. per 1000 c.ft. The surplus is estimated at £2840. The Stirling Gas Company have reduced the price to 1s. 0½d. per therm, equivalent to 4s. 11½d. per 1000 c.ft. This is a reduction of 7d. per 1000 c.ft. The Wick Gas Company have reduced the price of gas 7½d., making the rate now 7s. 1d. per 1000 c.ft.

A Lamplighter's Fraud.—At Bradford, on Tuesday of last week, John Seage, a Corporation lamplighter, was charged with obtaining unemployment benefit by false representation, while he was being paid as a lamplighter. He was only charged with receiving 2s. 6d., but it was stated that he had obtained altogether about £5 to which he was not entitled. He had obtained the money through the Amalgamated Society of Dyers, of which he was a member. The Bench said they were satisfied the defendant had secured money to which he was not entitled. It was a kind of fraud which was going on all over the country, and had to be stopped. The case was adjourned for a month to give defendant time to repay. The Magistrates will then consider what further to do.

Uppingham Gas Light and Coke Company.—The annual meeting of the Company was held last week, when Mr. F. Binley (the Chairman) presided. The accounts showed an expenditure of £5230, and a loss of £190. The Chairman stated that the Directors were determined to serve the town of Uppingham with gas throughout the trouble with the miners; and though it was rationed for a certain time, there was only one day when the supply was absolutely shut off. The Directors recommended that a dividend be paid to the amount of £100, to be met from the reserve fund. Mr. Thompson, who said that when he joined the Company no reserve fund existed, and he was one who advocated having a reserve, proposed that a dividend of 2½ p.ct. free of tax, from the reserve fund, be declared. This was adopted.

York Gas Company's Cookery Competition.—One of the most popular annual competitions among the children of the York Elementary Schools, which has recently taken place, is that in cookery for the girls, instituted six years ago at the instigation of the Directors of the York Gas Company. The competition is held at the Company's offices, with a set of cookers and equipment provided specially. The judge this year was Miss Nicholson, Superintendent of domestic subjects under the Leeds Education Committee, with Miss Dobson, who holds corresponding office in York, as supervisor. The test was the making of fish cakes and jam tarts, and the boiling of green peas; the competitors being required to clean their own pans and utensils after use. The Company provide the gas and materials, allow the girls to take the products home, give three prizes to the most successful girls, and present standard cookery books to all the competitors.

Morley Gas Finances.—The annual financial statement of the Morley Corporation gas undertaking, for the year ended March 31 last, shows a net deficit of £4746, as compared with a deficit of £937 in the previous year. The total accumulated deficiency is now £10,446. This is by far the worst year's result in the history of the undertaking; but it is pointed out that £5000, part of the cost of vertical retorts installed in 1914, was charged to revenue, and owing to war conditions it has not yet been possible to do anything to clear off this amount. The three months' coal strike involved heavy extra cost, and the unfavourable result is attributed largely to this. Mr. H. J. Hemingway (the Secretary and Manager) estimates the loss due to the dispute at £3000, out of the deficiency of £4746; and he attributes the balance to reduced sales owing to bad trade, to the progress of electric lighting, and to the fall in the value of residuals.

The Armagh Gas Company have reduced the price of gas by 10d. to 6s. 8d. per 1000 c.ft.

The Bingley Urban District Council last week decided to apply to the Ministry of Health for sanction to borrow £1000 for the provision of water-gas plant.

The Burton-on-Trent Corporation have decided to instal a further 150 "A. & M." patent pressure-wave automatic controllers upon their street-lamps for the ensuing season.

At the Bolton Police Court, last Friday, it was stated, during the prosecution of five young boys for throwing stones at the street lamps, that the breakages of these lamps alone cost the Corporation £484 a year.

STOCK MARKET REPORT.

THE Stock Exchange has had a fairly good week, though business was not as active as could be desired. The tone at the opening was favourable; and this continued until near the close, when there was a tendency to dulness. But the gilt-edged market had done well enough to bear this. Home Government issues had made nice advances, and the big four on Friday marked: Consols 59¾-59⅞, War Loan 100½-101, Funding 88⅜-88⅞, Victory 90⅜-91¼. Bonds kept in step, and Indian were firm. Home Rails made good advances until countered by profit-snatching, and Argentines rallied.

The Foreign Market was in good case; Argentine, Brazilian, Chilian, French, and Peruvian being prominent. Rubbers and Oils were irregular.

Business in the Gas Market was rather symptomatic of approaching autumnal quietude, and Gas Light and Coke was the only Company to exhibit any animation. But the general tone appeared to be unimpaired by inaction, and prices ruled firm where they were not actually advanced. The gainers were Gas Light ordinary 2, Brentford "A" and "B" 3 each, and Lea Bridge 5. Primitivas were unchanged; but Imperial Continental weakened, and was marked down 2.

The following transactions in gas during the week were recorded: On Monday, Brighton and Hove "A" 122¼, British 30½, European 12¼, Gas Light ordinary 96, 96⅛, 96¼, 96⅜, 96⅝, ditto maximum 63, Imperial Continental 157, 158½, Primitiva preference 40s., 41s. 10½d., Sheffield "C" 94⅜, South Metropolitan 97½, ditto preference 97½, South Suburban 100½, Brighton and Hove 7 p.ct. debenture 102, Swansea 7 p.ct. preference 103, Colonial Association 14s. 3d., 14s. 9d. On Tuesday, Alliance and Dublin 62¼, 62½, 63 7/16, Brentford preference 84, Gas Light ordinary 96, 96⅛, 96⅜, 96½, 96⅝, 96¾, 96⅞, ditto preference 78½, 79½, ditto debenture 62½, Hornsey 117, Imperial Continental 156½, 158½, Lea Bridge 97, South Metropolitan 96¼, 97½, South Suburban 100, ditto debenture 95, Wandsworth "A" 110, Brighton and Hove 7 p.ct. debenture 103, Monte Video 5 p.ct. debenture 75, Grays and Tilbury 7 p.ct. "B" 6⅜, 6 15/16, Colombo, 7⅝, 7¾, Colonial Association 14s. 3d. On Wednesday, British 30½, European 12¼, 12 9/16, Gas Light ordinary 96, 96⅛, 96¼, 96⅜, 97, ditto maximum 63, 64, ditto preference 78½, 78¾, ditto debenture 62¾, Imperial Continental 156, 156½, 157½, Monte Video 64½, Oriental 94½, Plymouth and Stonehouse 98½, 98⅝, Primitiva 15s. 6d. ditto preference 43s. 6d., San Paulo debenture, 36, 36½, Sheffield "C" 94, South Metropolitan 97, 97½, 97½, ditto debenture 62½, South Suburban 100, Swansea 7 p.ct. preference 103½, Colonial Association 14s. 7½d. On Thursday, Brentford "A" 94½, Commercial 4 p.ct. 95, ditto 3½ p.ct. 95, Gas Light ordinary 96¼, 96⅜, 96½, 96⅝, 96¾, 96⅞, 97, 97⅛, 97⅜, 97⅝, 97¾, 97⅞, ditto maximum 63, ditto 79, ditto debenture 63½, Imperial Continental 156, 157¼, 157½, Oriental 95, Primitiva 16s., ditto preference 41s. 3d., South Metropolitan 96½, ditto 6½ p.ct. debenture 106⅜, Colonial 7 p.ct. preference 14s. 6d. On Friday, Brentford "A" 93⅜, 95⅜, ditto "B" 93⅜, 94⅜, ditto preference 82, Cape Town preference 6½, Commercial 4 p.ct. 93½, ditto 3½ p.ct. 95, 95½, Continental Union preference 57, Gas Light ordinary 97⅜, 97½, 98, 98⅛, 98¼, 98⅜, 98¾, 99, 99⅛, 99½, ditto preference 78, Imperial Continental 156, 157½, Oriental 95½, Primitiva 15s., ditto preference 41s. 3d.. 42s. 6d., South Metropolitan 97, 97⅛, Hampton Court 5 p.ct. 84, 85.

In the Money Market, there was no point of much interest. The position for the most part continued very steady, tailing off at the close in a relaxation to greater ease. Discount terms ruled moderately firm throughout. Silver fluctuated from 35⅝d. to 35⅛d., at which last figure it closed. The Bank of England rate was 3 p.ct., as fixed on the 13th inst.

ANTE-WAR PRICES AND DIVIDENDS, LATEST DIVIDENDS, AND LAST WEEK'S TRANSACTIONS.

Issue.	Share.	When ex-Dividend.	Ante-War Dividend & Bonus.	Last Dividend.	NAME.	Closing Prices, July 30, 1914.	Present Prices.	Lowest and Highest Prices of Transactions.
£			p.c.					
182,049	Stk.	Mch. 15	4	4%	Aldershot 4 p.c. Pref.	..	70—75	...
1,551,868	,,	Apl. 12	2½	3 1/16%	Alliance & Dublin Ord.	59—64	60—65	62¼—63 7/16
374,000	,,	July 13	4	4%	Do. 4 p.c. Deb.	76—79	60—65*	...
280,000	5	May 18	7½	4/-	Bombay, Ltd.	5½—6½	4¼—5	...
100,000	5	Feb. 23	16	7½%	Bournemouth Gas and Water: 5 p.c.	..	11—12	...
383,110	10	,,	7	7%	Bournemouth Gas and Water: B 7 p.c.	15—15½	9—10	...
115,000	10	,,	6	6%	Bournemouth Gas and Water: Pref. 6 p.c.	13½—14	8—9	...
162,065	—	June 29	—	4%	Bournemouth Gas and Water: 4 p.c. Deb.	..	63—68	...
992,045	Stk.	Feb. 9	14	56/-	Brentford A Consolid.	261—266	93—98	93⅜—95⅜
734,920	,,	,,	11	55/-	Do. B New	204—209	93—98	93⅜—94⅜
55,000	,,	,,	5	5%	Do. 5 p.c. Pref.	109—111	80—85	82—84
221,400	,,	June 15	4	4%	Do. 4 p.c. Deb.	91—93	73—78	...
214,775	,,	Mch. 15	11	11%	Brighton & Hove Orig.	208—213	165—170	..
244,200	,,	,,	8	8½%	Do. A Ord. Stk.	154—159	118—123	122½
1,287,500	Stk.	July 28	5	5%	Bristol 5 p.c. max.	..	..	...
530,000	20	Mch. 15	12½	10%	British	44—45	29—31	30½
120,000	Stk.	June 29	4	4%	Do. 4 p.c. Deb. Stk.	88—90	76—80	...
245,771	,,	,,	4	4%	Buenos Aires 4 p.c. Deb.	85—87	53—58	...
100,000	10	June 1	—	7%	Cape Town & Dis., Ltd.	1¼—2¼	6¾—7¾	...
100,000	10	Apl. 27	—	4½%	Do. 4½ p.c. Pref.	4—6	6¼—7¼	6½
100,000	Stk.	June 29	4½	4½%	Do. 4½ p.c. Deb. Stk.	70—75	73—78	...
[137,150	,,	Feb. 26	5	5%	Chester 5 p.c. Ord.	108—110	..	...
1,513,280	,,	Mch. 15	5/9/4	42/8	Commercial 4 p.c. Stk.	106—108	91—96	93½—95
560,000	,,	,,	5½	38/4	Do. 3½ p.c. do.	103—105	92—97	95—95½
475,000	,,	June 15	3	3%	Do. 3 p.c. Deb. Stk.	69½—71½	55—60	...
800,000	,,	Dec. 15	4	—	Continental Union, Ltd.	76—79	37—42	...
200,000	,,	,,	7	—	Do. 7 p.c. Pref.	115—118	55—60	57
51,600	,,	Feb. 23	15	15%	Croydon A 10 p.c.	..	200—210	.
278,400	—	,,	12	12%	Croydon B and C 7 p.c.	..	160—170	...
492,270	Stk.	—	6	4½%	Derby Con. Stk.	123—125	80	...
55,000	,,	—	4	4%	Do. Deb. Stk.	102—104	65	...
1,002,180	10	July 13	10	5/0	European, Ltd.	17½—18	12—13*	12½—12 9/16
16,298,975	Stk.	Feb. 23	4/17/4	46/8	Gas Light and Coke: 4 p.c. Ord	98—102	97—99	96—99⅛
2,600,000	,,	,,	3½	35/-	Gas Light and Coke: 3½ p.c. max.	76—79	63—66	63—64
4,062,235	,,	,,	4	4%	Gas Light and Coke: 4 p.c. Con. Pref.	96—99	77—81	78½—79½
4,674,850	,,	June 15	3	3%	Gas Light and Coke: 3 p.c. Con. Deb.	72½—74½	62—65	62½—63½
130,000	,,	Dec. 11	10	10%	Gas Light and Coke: 10 p.c. Bonds	..	..	...
82,500	,,	Sept. 14	5	3½%	Hastings & St. L. 5 p.c.	..	78—81	...
258,740	,,	Mch. 15	3½	2½%	Do. 3½ p.c.	87—89	60—63	...
70,000	10	May 18	11	5%	Hongkong & China, Ltd.	16½—16¾	6—7	...
86,600	Stk.	Mch. 15	9	9½%	Hornsey 7 p.c.	..	115—120	117
131,000	,,	,,	7½	7½%	Ilford A and C	151—154	120—130	...
65,780	,,	,,	6½	5½%	Do. B.	115—118	100—110	...
65,500	,,	June 29	4	4%	Do. 4 p.c. Deb.	92—94	73—78	...
1,976,000	,,	May 18	9	5%	Imperial Continental	150—160	155—160	156—158½
404,800	,,	Feb. 9	3½	3½%	Do. 3½ p.c. Deb. Red.	84—86	74—79	...
235,242	,,	Mch. 15	6½	6½%	Lea Bridge Ord. 5 p.c.	119—121	93—98	97
2,498,905	,,	Feb. 26	10	37/6	Liverpool 5 p.c. Ord. A.	211—213	..	...
					Liverpool 5 p.c. Ord. B.	146—148	..	...
306,083	,,	June 26	4	4%	Do. 4 p.c. Pr. Deb. Stk.	..	..	...
165,736	,,	Feb. 23	7/5/6	6%	Maidstone 5 p.c.	..	87—92	...
63,480	,,	June 29	—	3%	Do. 3 p.c. Deb	..	47—50	...
75,000	5	,,	6	6%	Malta & Mediterranean Met. of Melbourne 4½ p.c. Deb.	4¼—4½	3¼—3¾	...
250,000	100	Apl. 3	4½	4½%		99—101	91—98	...
541,920	Stk.	June 1	4	4%	Monte Video, Ltd.	11½—12	63—68	64½
1,875,892	,,	Feb. 23	4½	4½%	Newcastle & Gatsh'dCon.	98½—99½	83½—84½	...
529,705	,,	June 29	3½	3½%	Do. 3½ p.c. Deb.	82—83	68—70	..
15,000	10	Aug. 26	—	7/6	North Middlesex 10 p.c.	..	12½—13	...
55,940	10	Mch. 15	7/14/0	10/18	,, ,, 7 p.c.	14—15	10½—11½	..
300,000	Stk.	May 18	8	8%	Oriental, Ltd.	117—122	92—97	94½—95½
60,000	5	—	10	—	Ottoman, Ltd.	7½—7¾	2—3	...
188,120	Stk.	June 29	—	6/3/9%	Plym'th & Stonh'se 5 p.c.	..	93—98	98¼—98¾
60,000	50	Mch. 15	13	62/6	Portsea Island, B	128—131	87—90	...
100,000	50	,,	12	57/6	Do. C	118—121	78—83	...
249,980	5	—	8	—	Primitiva Ord.	5½—6	⅛—⅞	15/—16/-
499,960	5	—	5	—	Do. 5 p.c. Pref.	4½—5	2—2½	40/—43/6
521,600	100	June 1	4	4%	Do. 4 p.c. Deb.	91—93	74—76	...
600,000	Stk.	Jan. 26	4	4%	Do. ,, ,, 1911	..	55—60	...
346,198	,,	June 29	4	4%	River Plate 4 p.c. Deb.	85—87	53—58	...
150,000	10	Mch. 30	6	6/-	San Paulo 6 p.c. Pref.	10½—11	5¾—6¼	...
125,000	50	July 3	5	5%	San Paulo 5 p.c. Deb.	47—49	35—38	36—36½
135,000	Stk.	Mch. 15	10	5%	Sheffield A	223—224	93—95	...
209,984	,,	,,	10	5%	Do. B	222—224	93—95	...
523,500	,,	,,	10	5%	Do. C	220—222	93—95	94—94⅜
133,201	Stk.	Sept. 15	4	4%	Shrewsbury 5 p.c.	..	..	...
90,000	10	June 29	9	7½%	South African	10½—11½	7—9	...
6,609,895	Stk.	Feb. 9	5/4/0	5%	South Met. Ord.	111—113	96—99	96½—97½
250,000	,,	July 13	—	5%	Do. Red. Pref.	..	94—96*	97¼
1,895,445	,,	,,	3	3%	Do. 3 p.c. Deb.	72½—74½	61—64*	62½
224,820	,,	Feb. 23	8½	8½%	South Shields Con. Stk.	157—159	109—111	...
1,087,795	,,	,,	6	5½%	S'th Suburb'n Ord. 5 p.c.	114—116	98—103	100—100½
368,837	,,	June 15	5	5%	Do. 5 p.c. Deb. Stk.	116—118	93—98	95
647,740	,,	May 18	5	5%	Southampton Ord.	99—102	70—75	...
121,275	,,	June 29	4	4%	Do. 4 p.c. Deb. Stk.	..	63—68	...
120,000	,,	Feb. 23	—	7½%	Tottenham and District: A 5 p.c.	135—138	112—117	...
782,275	,,	,,	6	5½%	Tottenham and District: B 3½ p.c.	115—117	98—103	...
181,255	,,	June 15	4	4%	Tottenham and District: 4 p.c. Deb.	87—89	75—80	...
182,380	10	Dec. 30	5	—	Tuscan, Ltd.	5—6	1—2	...
149,900	10	July 1	5	5%	Do. 5 p.c. Deb. Red.	93—95	45—50	...
236,476	Stk.	Mch. 15	5	3½%	Tynemouth 5 p.c. max.	108½—109	71—73	...
					Wandsworth, Wimbledon, and Epsom—Wandsworth A 5 p.c.	151—156	110—115	110
30,000	,,	Mch. 15	8½	66/3	Do. B 3½ p.c.	129—134	95—100	...
253,636	,,	,,	6½	51/3	Do. C.	..	85—90	...
108,075	,,	,,	—	46/4½	New Ordinary	..	85—90	...
140,865	,,	,,	—	46/4½	Wimbledon 5 p.c.	117—122	92—97	...
352,000	,,	,,	6½	45/-	Epsom 5 p.c.	121—126	95—100	...
98,000	,,	,,	6½	50/-	3 p.c Deb. Stk.	66—69	57—60	...
88,416	,,	June 29	3	3%				

* Ex Div.

Demy 4to. Limp Cloth. Price 10s. 6d.

THE FLOW OF GASES and PROPORTIONING GAS MAINS.

By

F. SOUTHWELL CRIPPS, Assoc.M.Inst.C.E.

WALTER KING, LTD., "GAS JOURNAL" OFFICES,
11, Bolt Court, FLEET STREET, E.C.4.

GASHOLDER AND TANK CONSTRUCTION AT THE SUTTON GAS WORKS.

1,000,000 cubic feet capacity.

By F. SOUTHWELL CRIPPS.

Price 10/6 net.

WALTER KING, LTD., "GAS JOURNAL" OFFICES,
No. 11, Bolt Court, FLEET STREET, E.C. 4.

H. MITCHELL, FOR PATENT SLOT METER PAD & OTHER LOCKS. 3 & 5, LEICHTON ROAD, KENTISH TOWN, N.W. R. & J. DEMPSIER, LTD., CONNAUGHT MANSIONS, 34, VICTORIA STREET, S.W. 1 MANCHESTER.